RS-232/422/485 to 10/100Base-TX
Device Server /
Managed Media Converter

User Manual

(January 2008)

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FCC WARNING

This equipment has been tested and found to comply with the limits for a class A device, pursuant to part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at the user's own expense.

CE

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Take special note to read and understand all the content in the warning boxes:

Warning

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1 About This Guide

1.1 Welcome

Thank you for selecting the RS-232/422/485 to 10/100Base-TX Device Server / Managed Media Converter. This unit is designed to provide an RS-232/422/485 connection over twisted-pair cable where the connected devices have RS-232/422/485 interfaces. Enabling serial devices such as CNCs and PLCs to instantly connect to an existing Ethernet/ Fast Ethernet network, the Serial-to-Ethernet Device Server / Managed Media Converter represents a robust solution for devices controllers for MIS personnel. This product can either be used as Device Server or Managed Media Converter.

1.2 Purpose

This guide discusses how to install and configure your Device Server / Managed Media Converter.

1.3 Terms/Usage

In this guide, the term “Device Server/Managed Media Converter” (first letter upper case) refers to your device, and “device server / managed media converter” (first letter lower case) refers to other device servers / managed media converter.

1.4 Features

- Device Server & Managed Media Converter Mode option
- Complies with EIA/TIA and IEEE standards
- Supports 4 wires full duplex asynchronous serial data transmission (RS-422/485)
- Supports 2 wires half-duplex asynchronous serial data transmission (RS-485)
- Supports serial port asynchronous data rates up to 115.2 Kbps
- Extended distances up to 1.2 km (24 AWG) using RS-422/485
- Auto-detecting 10/100 Mbps Ethernet interface
- Terminator feature improves signal quality and distance
- LEDs for ‘at-a-glance’ device status
- Wall mount or Din-Rail mountable installation
- Power range 9~32V DC
- FCC Class A & CE approved

1.5 Specifications

Standards: IEEE 802.3 (10BASE-T Ethernet);
IEEE 802.3u (100BASE-TX/ Fast Ethernet); EIA/TIA RS-232/422/485; EIA/TIA-5744

Ports: 1x UTP 100/120ohm; RJ-45 type
1x 9-pin serial connector; D-sub, Male

Max. Distance: UTP: 100 meters (Cat 3/4/5.)
Serial: 15 meters (RS-232)
1,200 meters (RS-422, RS-485)

Data Rates: UTP: 10 or 100 Mbps
Serial: 115.2 kbps (asynchronous)

Signals: RS-232: TxD, RxD, CTS, RTS, DTR, DSR, RI, DCD, GND RS-422: TxD+/-, RxD+/-, GND RS-485: Data+, Data-, GND

Configuration: Bits Per Second: 38400
Parity: None
Data bits: 8
Stop bits: 1
Flow Control: None
(The console connection is only available once the DIP switch 1 is ON)

Switches: DIP 1: Enables / disables console / data communication mode
DIP 2: Enables / disables RS-232
DIP 3: Enables / disables RS- 422/485 (4-wire)
DIP 4: Enables / disables RS-485 (2-wire)
DIP 5: N/A
DIP 6: N/A
DIP 7: Enables / disables termination (TMR)

Power: External power adapter; 9~32V DC @800mA
Frequency: 47Hz to 63Hz

Environment: Temperature: Operating: 0°C to 50°C
Relative Humidity: 10% to 80%, non-condensing
Storage: -20°C to 80°C
Relative Humidity: 5% to 90%, non-condensing

Emissions: FCC Part 15 of Class A & CE approved

Dimensions: 109.2 x 90 x 30mm (L x W x H)

Weight: 280 grams

1.6 Package Contents

The package should include the following:

- One Device Server / Managed Media Converter
- One power adapter (please check connector type and input power specification)
- Four self-adhesive pads
- DIN Rail Kit
- Screws for wall-mount installation
- Quick Installation Guide
- User Manual CD
- Serial IP Redirector software CD

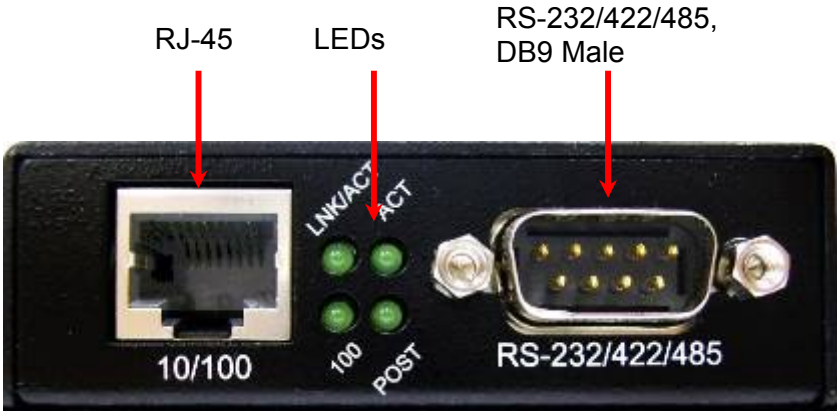
2 Hardware Description

2.1 Product Overview

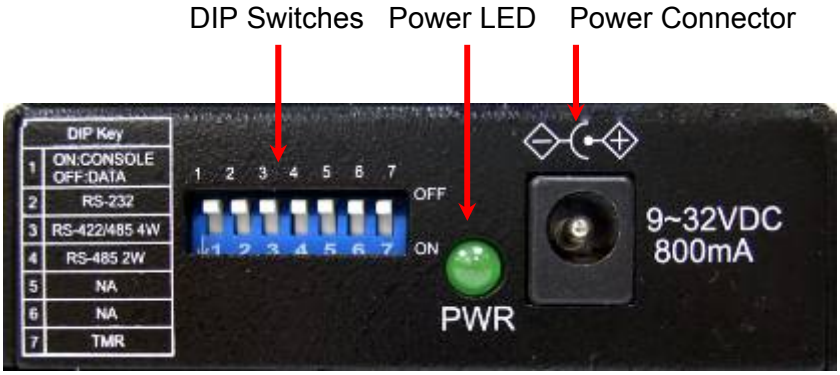
The Device Server features complete Ethernet and TCP/IP network support that allows devices in industry with RS-232/422/485 connectors such as milling machines, measurement instruments, and robots to connect to LAN based automation. Other devices typically found on campus networks such as card readers, code readers, lab equipment, medical equipment, and other similar serial devices can now instantly migrate to a TCP/IP network. Additionally, by deploying the device server mode, enable users to monitor and manage up to 256 serial devices from single PC with the help of Serial IP Redirector software for Device Server mode.

2.2 Product Illustrations

Front Panel



Rear Panel



3 Installation

To install your Device Server, please see the following procedures:

- Location
- Din Rail Mounting
- Desktop Installation
- Powering On Unit
- Connecting Copper Cables
- DB9 Male Connector Pin Assignment
- Serial Connection
- Ethernet Connection

3.1 Location

The location selected for installing the Device Server may greatly affect its performance. When selecting a site, we recommend considering the following rules:

1. Install the Device Server in a fairly cool and dry place. See *Technical Specifications* for the acceptable temperature and humidity operating ranges.
2. Install the Device Server in a location free from strong electromagnetic field generators (such as motors), vibration, dust, and direct exposure to sunlight.
3. Leave at least 5cm of space at the front and rear of the unit for ventilation.
4. Affix the provided rubber pads to the bottom of the Device Server for grip, and to protect the case from scratching.

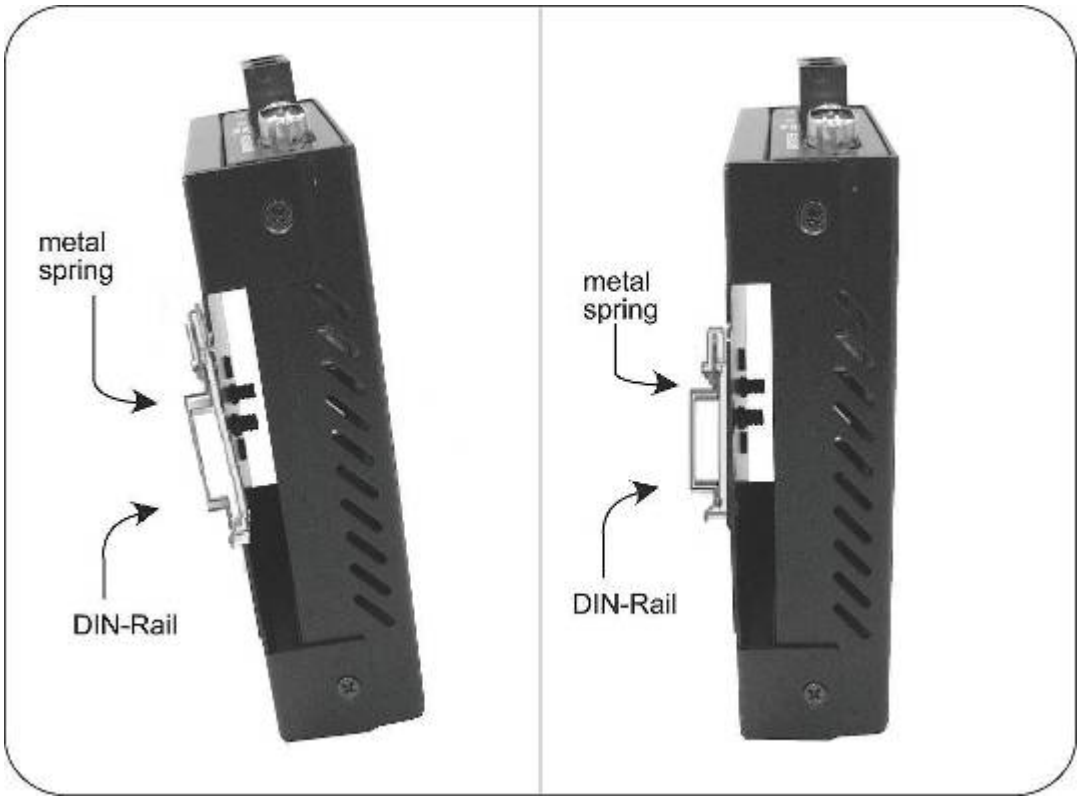
3.2 Wall Mount Installation

The Device Server/Managed Media Converter can also be installed by wall mounting. The backside casing provides space for two screws each side. Identify the exact location at wall by placing the Device Server and marking the screw positions. Use the screw (include in the package) and snug them well to fix it.

3.3 Din Rail Mount Installation

The aluminum DIN Rail attachment plate should already be affixed to the back panel of the Device Server. If you need to attach the DIN Rail plate, assure that the stiff metal spring is situated towards the top. Attaching the Device Server to the DIN rail is easy, just align, and attach the top rail, then press down and snap forward it to snap in the bottom rail, as shown in the figures below.

Use following steps set up the Device Server:



- The surface must support at least 500 gm for the Device Server.
- The power outlet should be within 1.82 meters (6 feet) of the Device Server.
- Visually inspect the power adapter and make sure that it is properly connected.

Make sure that there is proper heat dissipation from and adequate ventilation around the Device Server. Do not place heavy objects on the product.

Warning Please exercise caution when using power tools. Also, install this unit away from damp or wet locations, or in close proximity to very hot surfaces. These types of environments can have a detrimental effect on the unit and cables.

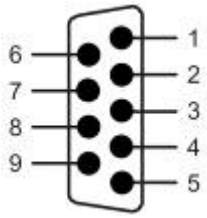
3.4 Powering On Unit

The Device Server uses external power supply 9~32V DC @ 0.8A 50~60 Hz.

1. Insert the power cable plug directly into the receptacle located at the back of the device.
2. Plug the power adapter into an available socket.
3. Check the rear-panel LEDs as the device is powered on to verify that the Power LED is lit. If not, check that the power cable is correctly and securely plugged in.

NOTE: The RJ-45 port accepts both ‘straight-through’ and ‘cross-over’ Ethernet cables without the need to re-configure the port.

3.5 DB9 Male Connector Pin Assignments

	PIN	RS-232 (Full-duplex)	RS-422/485 4-wire (Full-duplex)	RS-485 2-wire (Half-duplex)
	1	DCD		
	2	RX	RX-	**DATA B(-)
	3	TX	TX-	
	4	DTR		
	5	GND	GND	GND
	6	DSR		
	7	RTS	RX+	**DATA A(+)
	8	CTS	TX+	
	9	RI		

NOTE: Bi-directional RS-485 BUS line.

For RS-232 cable connection, use cross-over cable when connecting to a DTE device, and straight-through cable for connecting to a DCE device. See Appendix for illustration.

3.6 Serial Connection

The Device Server features DIP switches on the rear panel that sets the unit to the correct type of cable configuration to support connection with a RS-232 / 422 / 485 device.

Definition of DIP Switches

No	Dip description	Default
1	ON: Console / OFF: Data	OFF
2	RS-232	ON
3	RS-422 / 485 (4W)	OFF
4	RS-485 (2W)	OFF
5	NA	OFF
6	NA	OFF
7	TMR (Terminator)	OFF

For setting the control function of the serial port, see the table below:

DIP 1	Serial Connection
ON	**RS-232 Console**
OFF	**Data Communication**

NOTE:

1. If using console mode turn the DIP Switch 1 to ON position. For data communication from the serial device keep the DIP switch 1 to OFF position. In case of ON position data communication will be blocked and at OFF position console port access blocked.
2. In RS-232 Condole mode (DIP Switch 1 = ON), all other DIP Switch settings are ignored. In Data Communication mode (DIP Switch 1 = OFF), properly set other DIP Switches for serial interface modes.

3. For some RS-422/485 devices, which may not be designed to provide DB-9 connection, please check the pin definition to connect the devices.
4. For the first time installation, you have to use console mode to setup the IP and TCP port configuration with RS-232 cable. Always use Cross Over cable, if using Straight Through, you must use “Null Modem” to use Telnet option.

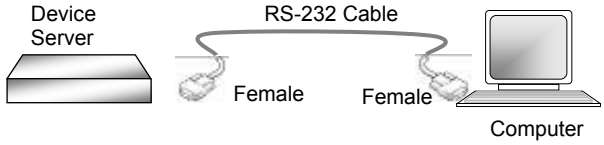
4 LED Indicators

This device has LED indicators located at the front of the device. The LEDs have been designed to give easy at-a-glance network status, and provides 'real-time' connectivity information. Please see below for an interpretation of their functions:

LED Indicators		
LED	Condition	Status
PWR	On (Green)	Unit is receiving power
	Off	Power off or failure
LNK / ACT (RJ-45)	On (Green)	Illuminated when RJ-45 connector attached and link signals received
	Flashing (Green)	Data traffic passing through RJ-45 port
100	Off	No link established
	On (Green)	RJ-45 port in 100Base mode
ACT	Off	Port is operating at full duplex
	On (Green)	Receiving data packets
	Flashing	RS-232/422/485 data packets being transmitted or received
POST	Off	No data packets received
	On (Green)	Indicates normal operation

5 User Interface Startup

There are two separate methods for configuring the Device Server for use. In the first section of this chapter, the Command line Interface (CLI) or Menu-driven interface via the *Console Port* to set the device IP and TCP configuration to monitor/managed the attached serial device via Serial IP Redirector software. The second section will describe *CLI or Menu-driven via Telnet* configuration. Firstly, make the connection below:



DIP Switch 1 set to 'ON' position

5.1 Console Port Access

The Device Server is accessible via a terminal emulator attached to the RS-232 console port. Please follow the step below.

1. Attaching the serial cable to COM port of computer and serial port of device server.
2. Select Hyper Terminal from (start menu → programs → Accessories → communication) a window will appear, assign the connection name. Then select the correct available COM port (COM1 or COM2). After this enter the port settings as below.
   Bits per seconds: 38400
   Data bits: 8
   Parity: None
   Stop bits: 1
   Flow Control: None
3. Once connection is established, you will see a log in screen.

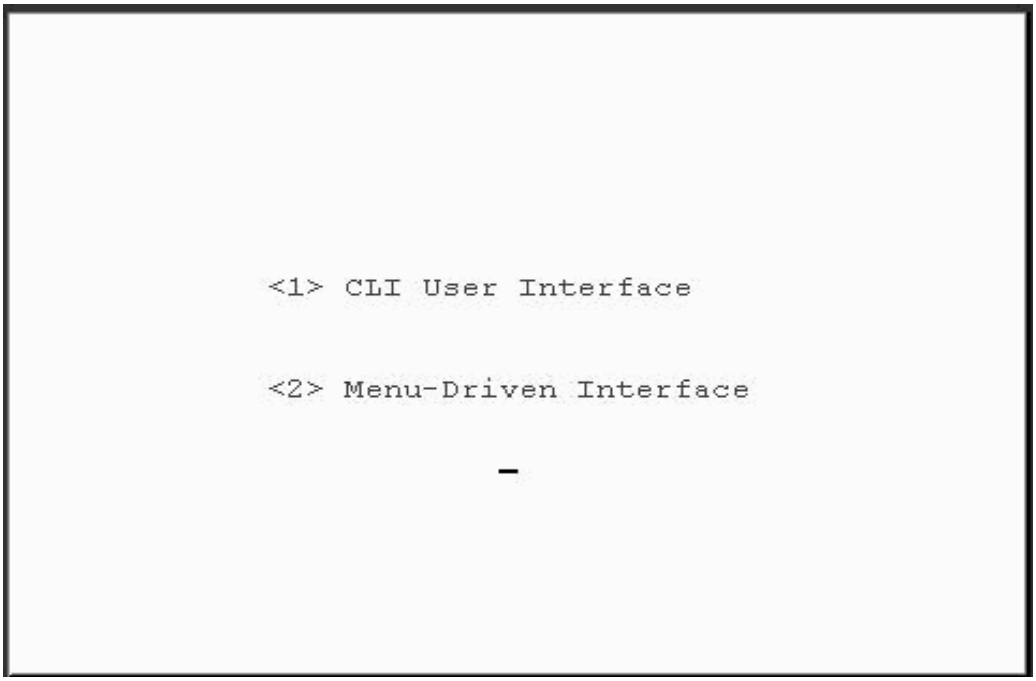
```
Transition Networks
Firmware version: 1.03.08 (built at Jan  7 2008 16:59:13)
Press <ENTER> key to start.
```

Press **ENTER** and on the following screen, type the default username **admin,** leave the password field blank since there is no default value and press **ENTER** to proceed.

```
Transition Networks
Firmware version: 1.03.08 (built at Jan  7 2008 16:59:13)
Press <ENTER> key to start.

Username: admin
Password:
```

4. Select either CLI User Interface or Menu-driven Interface option by using the associated number key or using the **TAB** key and pressing **ENTER**. A relevant Main Menu screen appears.



The Device Server is preset with a factory IP address (192.168.0.254) that must be configured to the user's individual IP address. It is important to do this so that the Device Server doesn't conflict with other devices with the same defaults.

NOTE:
Prior to following the instructions for HyperTerminal Configuration, ensure that a serial cable connection between the Device Server and workstation exists.

Type the following command line to change the device IP address in CLI mode where **xxx**'s represent values between **0** and **254** and the user should enter their own IP address in this form.

a) set eth0 ip **xxx.xxx.xxx.xxx**

If using the Menu-driven interface. Select the **System Information** from the Main Menu and following screen will appear. Use **TAB** key to move the cursor and **<Enter>** to change the value. Once change the value, select **<SAVE>** to apply the changes.

```
                System Information
                ==================

        Description     : Serial/IP Device Server & Converter
        Model Name      : RS232/422/485 Device Server & Converter
        Company Name    : Transition Networks
        Board Name      : 6700-00634-0100
        MAC-1 Address   : 00:0B:04:04:E2:A9


        DHCP Client     : Disabled
        IP Address      : 192.168.0.150
        Subnet Mask     : 255.255.0.0
        Gateway         : 192.168.0.1



                  <SAVE>          <ESC>

            <Tab> to move | <Enter> to select
```

After entering the new IP address the system will confirm whether the operation is successful.

NOTE:
Copy the new address down on a piece of paper. You will need the address when you are going to use Telnet or set up data transfer/communication connection.

Warning
IP addresses are unique! If an address isn't available, please contact the appropriate authorities to apply for one.

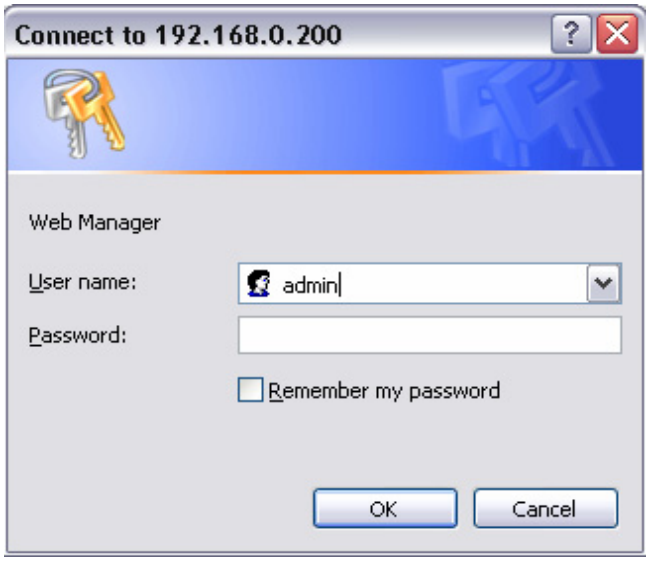
5.2 Telnet Access

The Device Server is accessible via a Telnet. At the command prompt type **telnet 192.168.0.254** (If connecting with default IP). You will be prompted to enter user name and password as mentioned and shown in the topic Console Port Access. Use CLI or Menu-driven interface to perform the changes.

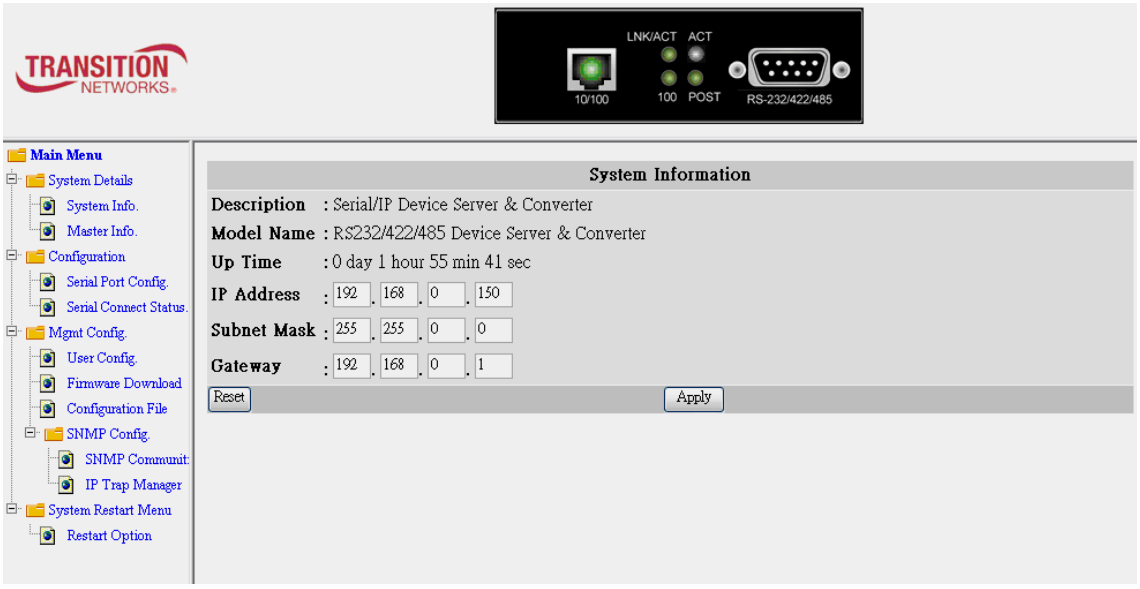
NOTE:
The only limitation of Telnet Access is that users can not assign new IP address to device server. Please use Console Port Access or Web Access to assign new IP address.

5.3 Web Access

The Device Server is accessible via a web browser once connected to the network. Type the IP address at web browser **192.168.0.254** (if connecting with default IP). A window will pop up to prompt you enter user name and password.



After successful login, the main screen will appear.

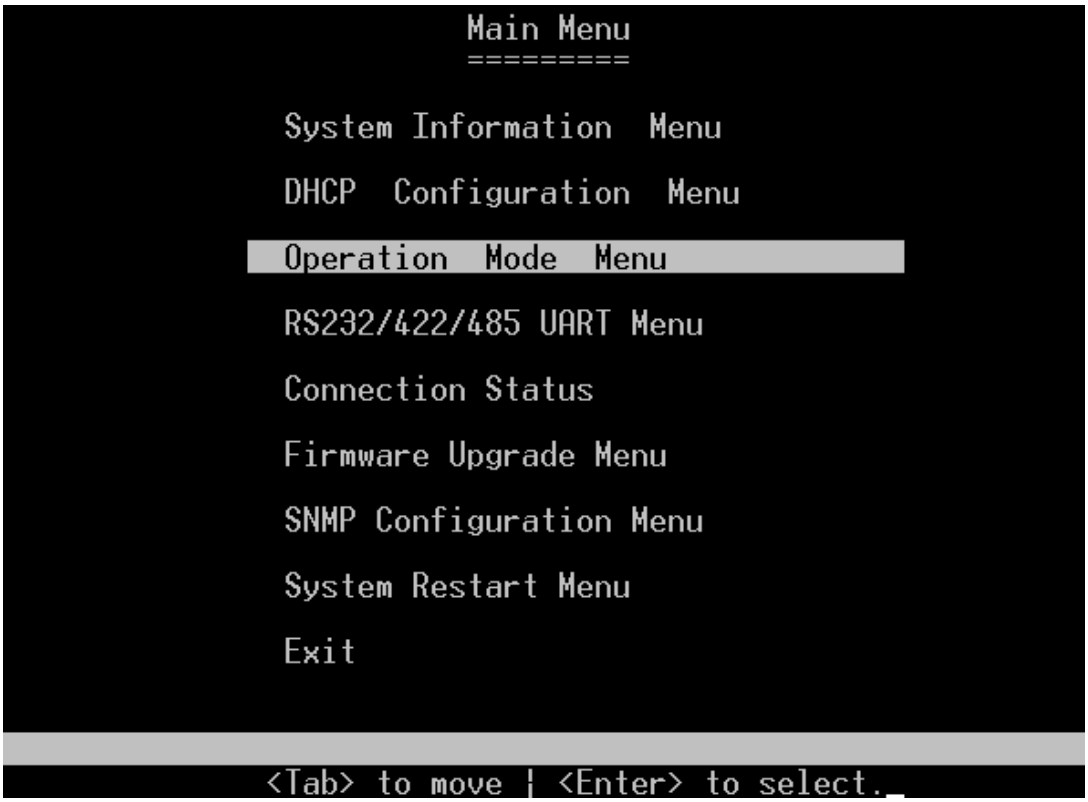


6 Configuration Management

Users can manage the Device Server via menu-driven interface or command line interface from Telnet or serial console, or Web graphic user interface.

6.1 Menu-driven User Interface

The figure below shows the Main Menu screen. From this screen the configuration options available provide the user to quickly access and adjust the device server settings as required.

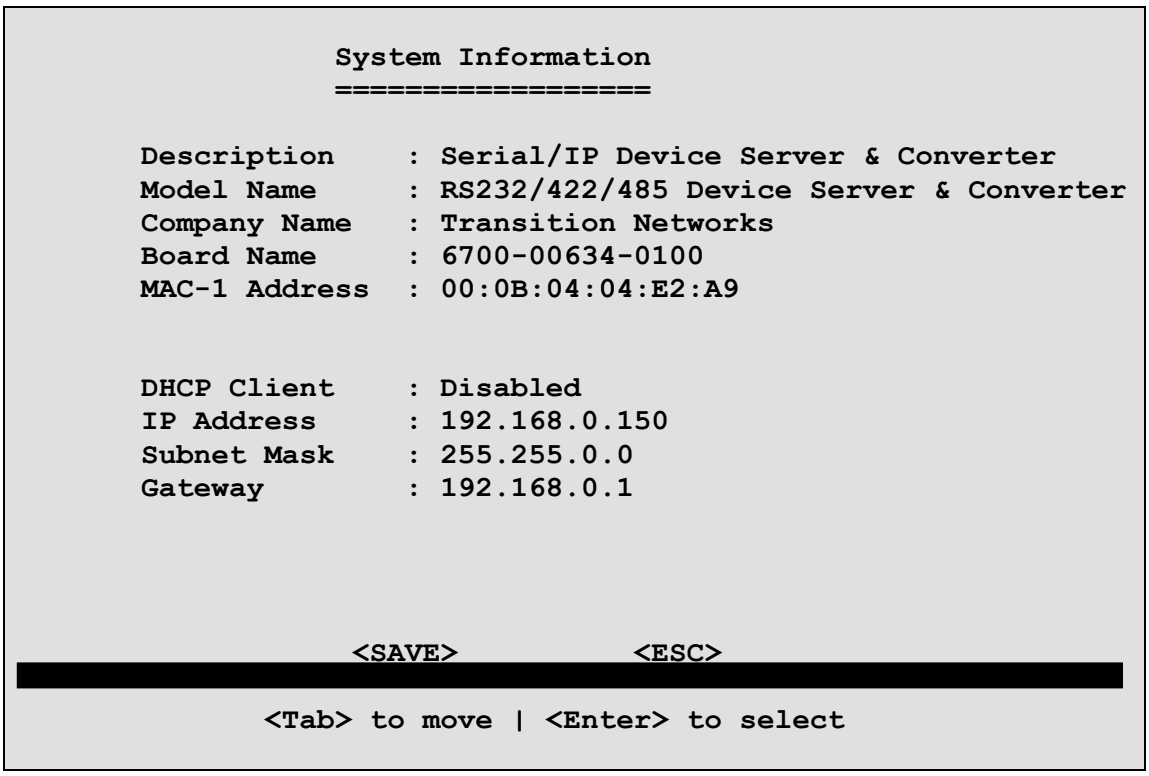


Main Menu Screen

Use **TAB** key to move the cursor to different fields and press **Enter** to select/edit the option.

6.1.1 System Information Menu

From this menu, the user can view system-related information and the default IP address. The user should set up an appropriate IP address, subnet mask and Gateway for his/her own network. After entering a new IP address, Telnet and data communication will be based on the new address.


System Information
Description : Serial/IP Device Server & Converter
Model Name : RS232/422/485 Device Server & Converter
Company Name : Transition Networks
Board Name : 6700-00634-0100
MAC-1 Address : 00:0B:04:04:E2:A9
DHCP Client : Disabled
IP Address : 192.168.0.150
Subnet Mask : 255.255.0.0
Gateway : 192.168.0.1
<SAVE> <ESC>
<Tab> to move | <Enter> to select

System Information menu

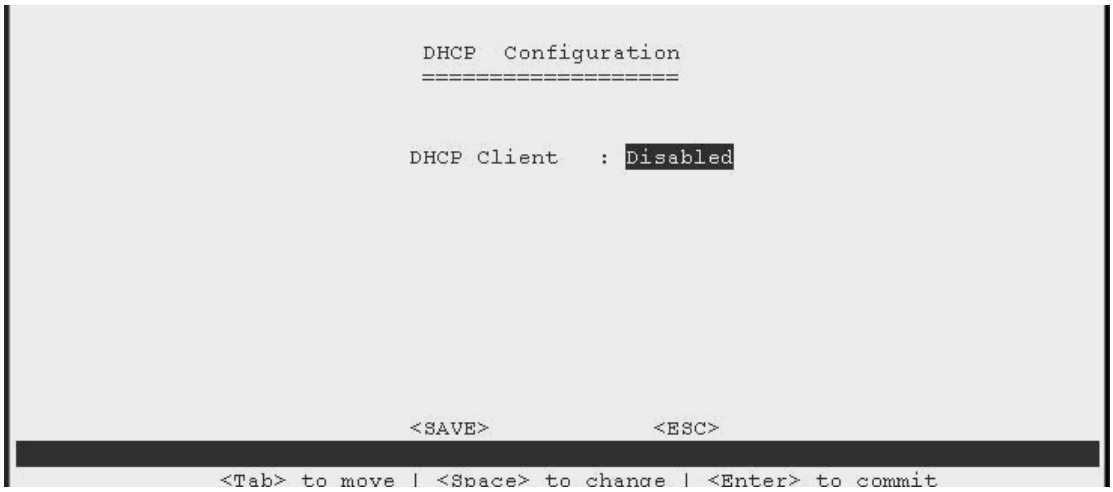
Once changes are made, move the cursor to **<SAVE>** by using the **TAB** key and press **Enter** to save the settings. Changing the IP address will automatically restart the Device Server.

NOTE:
In Telnet mode you can't change the IP address.

6.1.2 DHCP Configuration Menu

DHCP (Dynamic Host Configuration Protocol) allows the Device Server to obtain an IP address from the DHCP server automatically.

NOTE:
A DHCP server must exist and be available in your local network prior to enabling the DHCP client.



DHCP Configuration menu

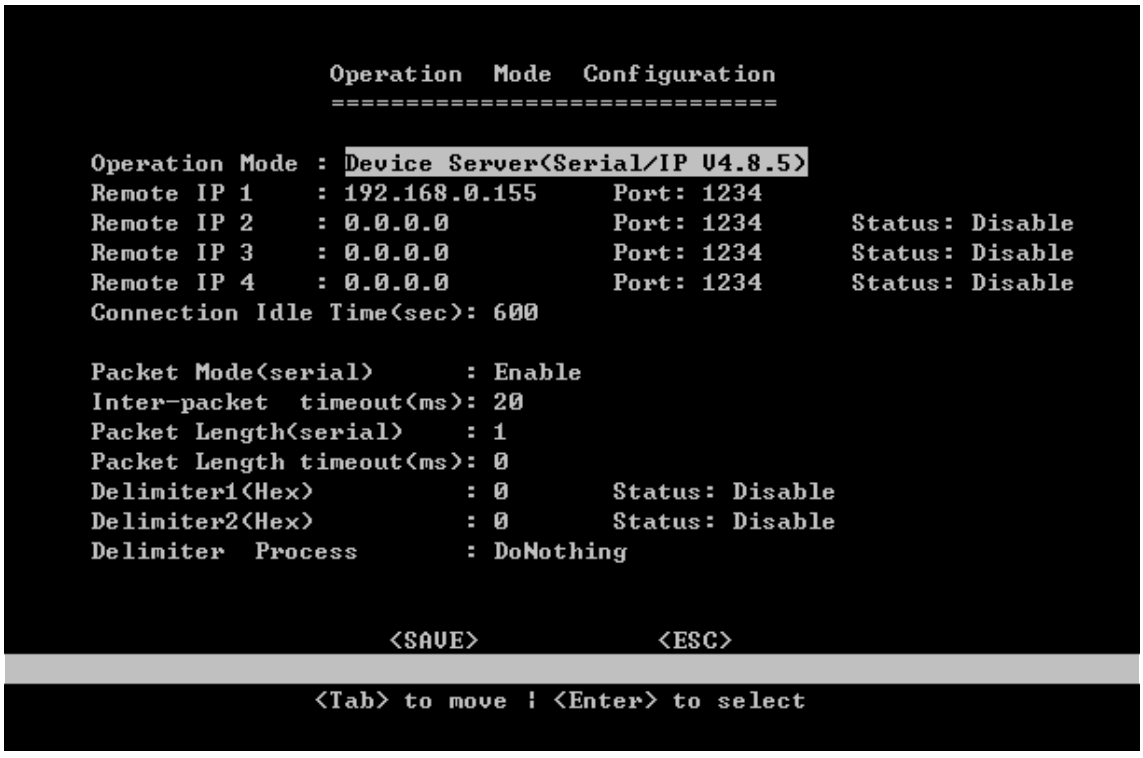
Use the **Spacebar** to enable/disable the DHCP Client settings. Select **<SAVE>** to apply the settings and **<ESC>** to move to the previous menu. If you don't want to save the changes made, just select **<ESC>** and you will move to the previous menu without making any changes.

6.1.3 Serial Port Config Menu

This page offers the option for the communication model and operation mechanism of Device Server. Please select the appropriate mode as required for your application. The user can also monitor the serial port status and configure TCP port numbers from this menu.

- The unit offers six modes (TCP Server / TCP Client / Converter Mode / UDP Server / UDP Client / Device Server). Please restart the unit after selecting the desired mode.

Note: In case of using Converter Mode Mode, we recommend you keep the Packet Mode option set at **Disable**.
A detailed explanation of the setting choices are given underneath the following screenshot:


Operation Mode Configuration
Operation Mode : Device Server(Serial/IP V4.8.5)
Remote IP 1 : 192.168.0.155 Port: 1234
Remote IP 2 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 3 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 4 : 0.0.0.0 Port: 1234 Status: Disable
Connection Idle Time(sec): 600
Packet Mode(serial) : Enable
Inter-packet timeout(ms): 20
Packet Length(serial) : 1
Packet Length timeout(ms): 0
Delimiter1(Hex) : 0 Status: Disable
Delimiter2(Hex) : 0 Status: Disable
Delimiter Process : DoNothing
<SAVE>
<ESC>
<Tab> to move ! <Enter> to select

EXPLANATION: Server/Client Mode Configuration	
Operation Mode	**TCP Server:** the TCP Server mode of the Device Server allows TCP connections from up to four Device Servers with TCP Client mode or PC with Serial IP Redirector program running. **TCP Client:** the TCP Client mode of the Device Server can establish up to four TCP connections with Device Servers of TCP Server mode. **UDP Server:** the UDP Server mode of the Device Server allows the communication initiated from up to four UDP Clients. **UDP Client:** the UDP Client mode can communicate with up to

	four UDP Servers in UDP communication model. **Device Server (Serial/IP v4.8.5):** use Serial IP Redirector v4.8.5 to remote connects to the Device Server as Server role of RFC-2217 COM Port Control Protocol. **Device Server (Serial/IP v4.6.2):** use Serial IP Redirector v4.6.2 to remote connects to the Device Server as Server role of RFC-2217 COM Port Control Protocol. **Converter Mode:** two Device Servers communicate with each other through point-to-point architecture in TCP communication model. The TCP Client and Server roles of two Device Server peers are negotiated automatically.
Remote IP 1~4	IP addresses of the other end device or Serial IP Redirector workstations.
Port	The TCP port number corresponding to each remote IP that the TCP Server is bound to.
Status	Toggle between "Enable" and "Disable" for activating or deactivating the second to the fourth remote IP/Port entries.
Connection Idle Time	In seconds. The TCP Server or Client will disconnect the TCP session if no packets are transmitted in the set period.
Packet mode (serial)	Enabled – input data from the serial interface is treated as serial packets. Disabled – input data from the serial interface is treated as bit streams.
Packet mode inter-packet timeout	In milliseconds. The delimiter value for recognizing the timeout gap between serial packets if Packet Mode is enabled.
Delimiter1(Hex)/ Status	Besides the inter-packet timeout, serial packets can be delimited by one or two trailer bytes of specific values. Delimiter 1 is the hexadecimal number of the first delimiter byte. Toggle to "Enable" on the "Status" field for delimiting serial packets according to trailer byte rather than inter-packet timeout.
Delimiter2(Hex)/ Status	The hexadecimal number of the second delimiter byte. If this byte is "Disable" and the Delimiter 1 is "Enable", the delimiter byte length is one.
Delimiter Process	Do Nothing: keep the delimiter bytes when transforming to IP packets. Strip Delimiter: Strip off the delimiter bytes when transforming to IP packets.

NOTE:

For Device Server Mode, in case you are using a serial device with a 2-wire RS-485 application or Modbus RTU protocol, do not forget to "**Enable**" the "Packet" mode of serial input. Also enter the appropriate inter-packet timeout value or delimiter byte values to enable smooth data communication.

To set the timeout value via console mode, first "**Enable**" the packet mode and "Save" the settings. Once settings are applied, you will be able to change the timeout or delimiter values.

Changes to the settings are saved to a system flash memory and do NOT take effect until a system reset or reboot has occurred. This action validates the new settings. Please note that you can't change the operation mode by using Telnet. Always use Web Interface or Console access to change the Mode.

Next Page: More information on Operation Modes

Applications for Operation Modes:

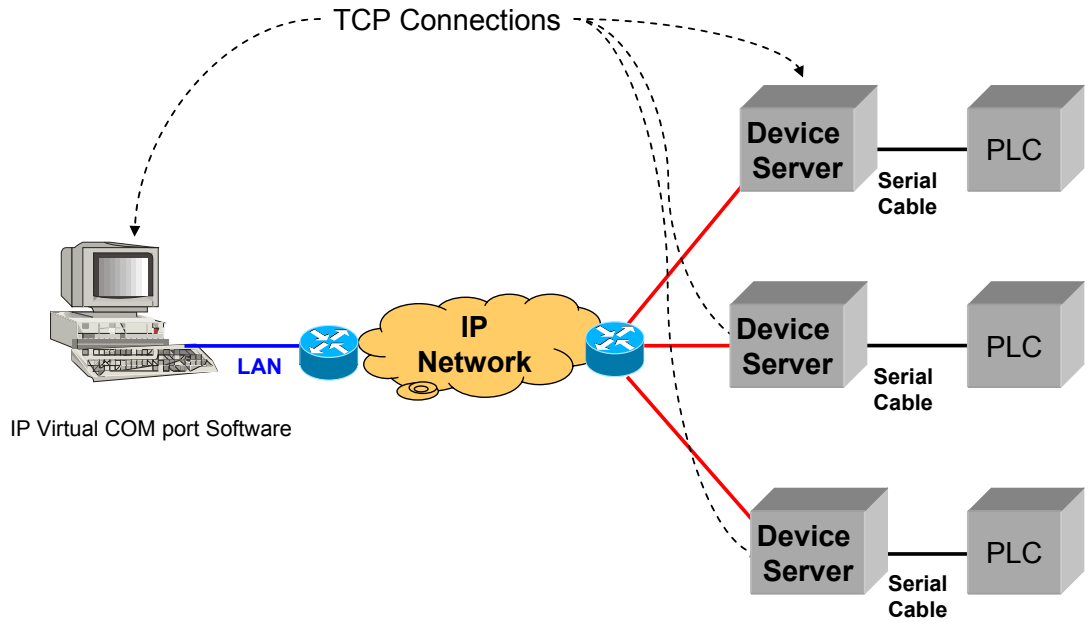


Diagram 1 – Central Management Application (Device Server Mode)

Device Server Mode: In this mode the Device Server acts in the Server role of the RFC-2217 COM Port Control Protocol.

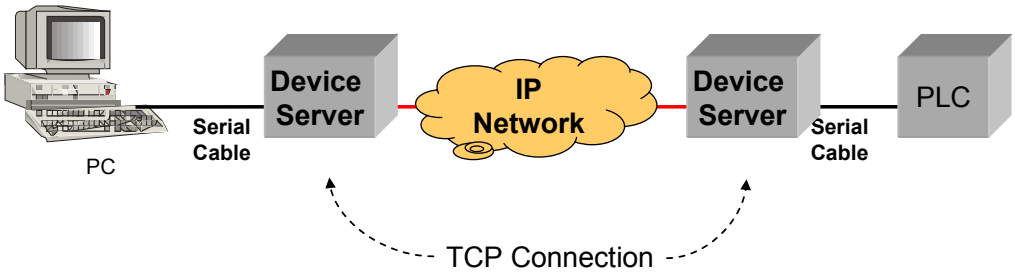


Diagram 2 – Peer-to-Peer Application (Converter Mode)

Converter Mode: In this mode the Device Server/Managed Media Converter acts like an advanced media converter. Like a normal converter, the Device Server/Managed Media Converter communicates with a remote Device Server/Managed Media Converter in a peer-to-peer fashion. Also, the Device Servers communicate with each other through an IP network in the TCP communication model. The TCP Client and Server roles of the two Device Server peers are negotiated automatically.

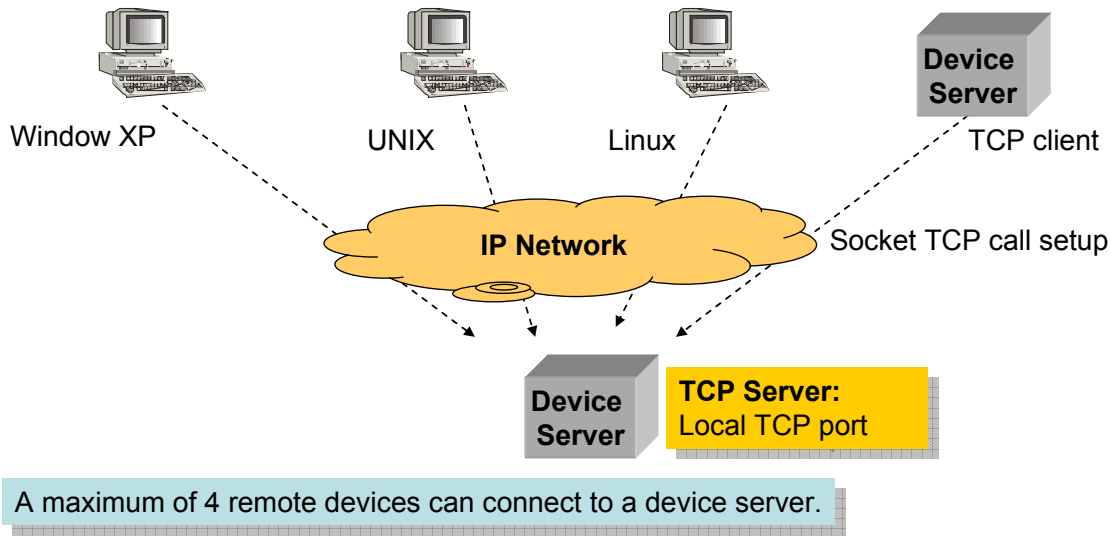


Diagram 3 – Multi-host Application (TCP Server mode)

TCP Server Mode: In this mode the Device Server/Managed Media Converter acts as a device server and functions as a network agent for the serial device. For example, when a serial device with a serial console port is connected to the Device Server/Managed Media Converter while it is in TCP Server mode, the console port becomes a network-accessible interface via the Device Server. In TCP Server Mode, the Device Server can link the serial device and a TCP-operating control host by providing two-way transmission between the two.
In TCP **Server** mode, the Device Server/Managed Media Converter **waits** for the control host to initiate communication with the serial device. Conversely, in TCP **Client** mode (next diagram) the Device Server/Managed Media Converter **initiates** communication with one or up to four remote devices simultaneously – when the serial device experiences a communication event and prompts the Device Server/Managed Media Converter to initiate communication.

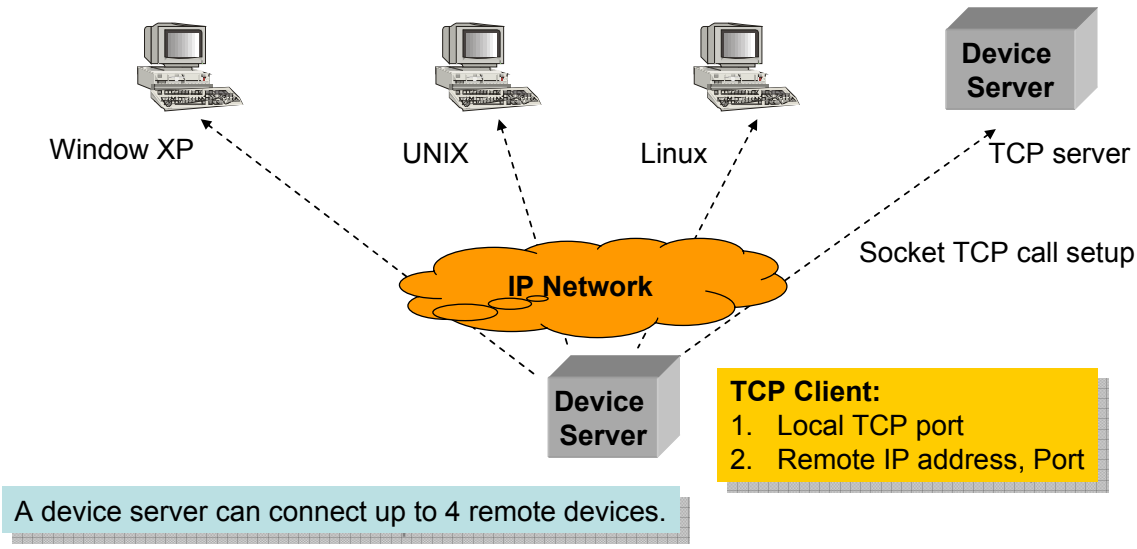


Diagram 4 – Multi-host Application (TCP Client mode)

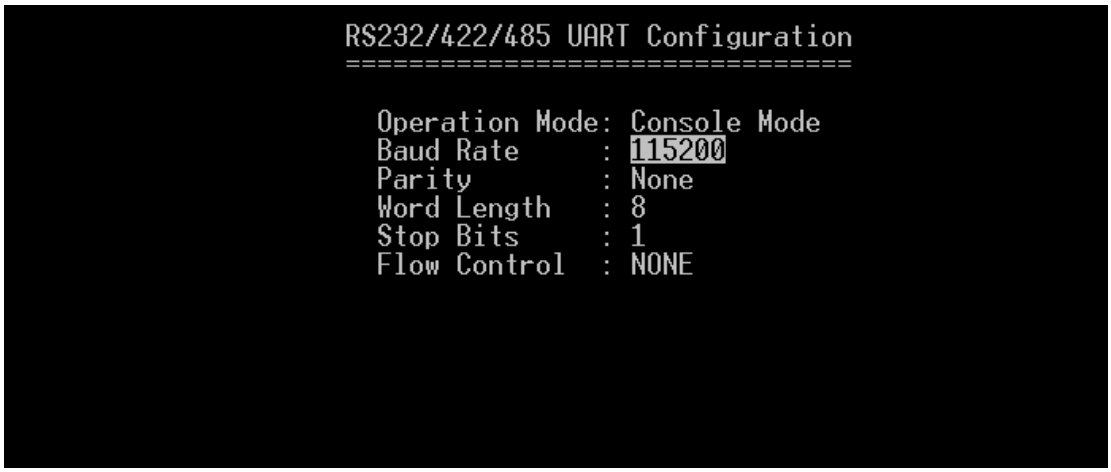
TCP Client Mode: This mode lets the Device Server/Managed Media Converter act as a bridge for serial devices that must communicate with server hosts like the Linux, Unix

and Windows systems. In this Client mode, the Device Server establishes a temporary TCP connection with the servers automatically after powering up. All the data received from the serial device is then sent to remote servers. The servers can also send data back to the serial device while the connection is active. The Device Server/Managed Media Converter automatically ends the connection when all information is sent and the connection becomes idle for a specified length of time. It will reestablish the connection when it receives data from the serial device.
In TCP **Server** mode (previous section), the Device Server/Managed Media Converter **waits** for the control host to initiate communication with the serial device. Conversely, in TCP **Client** mode the Device Server/Managed Media Converter **initiates** communication with one or up to four remote devices simultaneously – when the serial device experiences a communication event and prompts the Device Server/Managed Media Converter to initiate communications.

6.1.4 RS-232/422/485 UART Menu

This window will show you the serial port configuration.

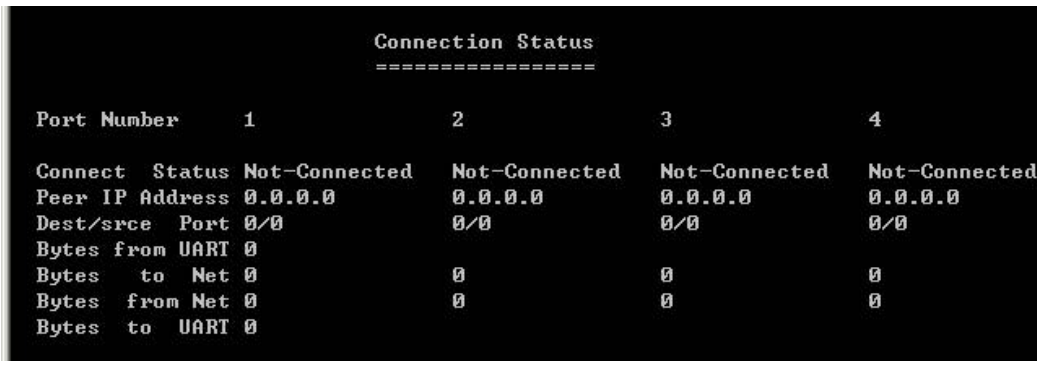
The screenshot below shows the different configuration options (the screenshot is followed by a detailed explanation of the different options):



RS232/422/485 UART Configuration (Serial Port Configuration)	
Operation Mode	A read-only attribute. It shows the RS232/422/485 mode set by the DIP switch.
Baud Rate	The speed of the serial interface.
Parity	Select or disable the parity checking method
Word Length	The length of data in bits
Stop Bits	The bit length of stop bits
Flow Control	The flow control method for informing the correspondent

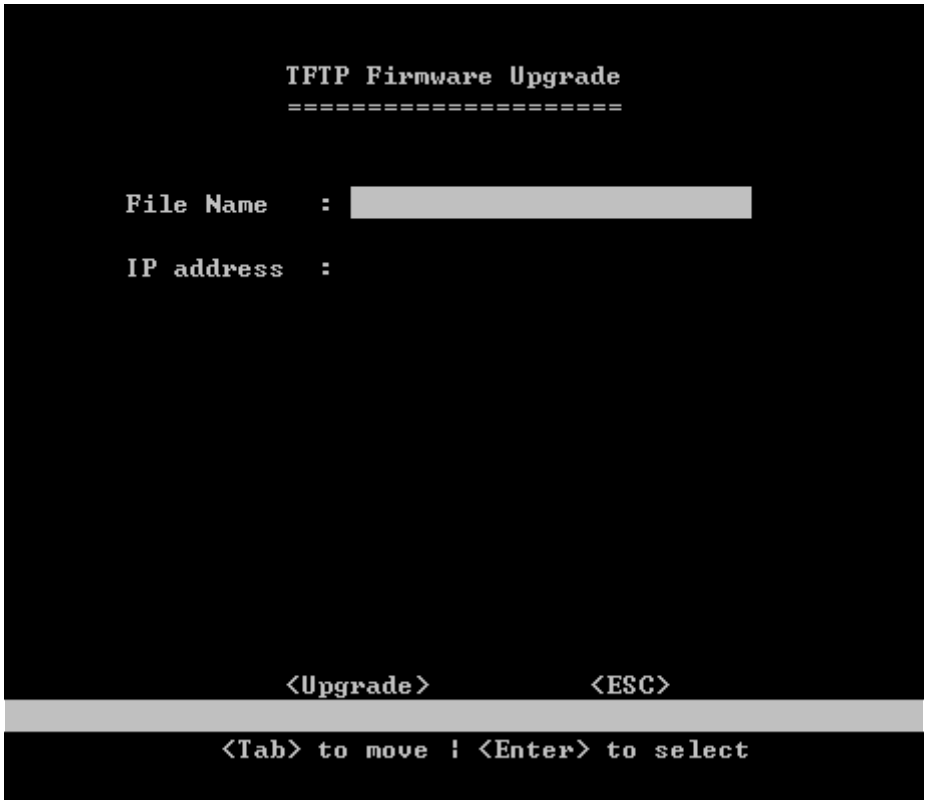
6.1.5 Connection Status

This screen provides at-a-glance system status information.


Connection Status
Port Number 1 2 3 4
Connect Status Not-Connected Not-Connected Not-Connected Not-Connected
Peer IP Address 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0
Dest/srce Port 0/0 0/0 0/0 0/0
Bytes from UART 0
Bytes to Net 0 0 0 0
Bytes from Net 0 0 0 0
Bytes to UART 0

6.1.6 TFTP Firmware Upgrade

From this menu, the user can upgrade the existing firmware to newer firmware available from a TFTP server. Simply enter the file name of the updated firmware in the file name field and enter the IP address of the TFTP server in the IP address field to perform the upgrade. Selecting **<update>** will start downloading the newer firmware and system will restart to apply the firmware. For ensuring correct parameter values for Device to be functioning after firmware upgrade from a prior version with different configuration structure and data format, please Restore Factory Default Settings in System Restart Menu.



TFTP Firmware Upgrade menu

6.1.7 SNMP Configuration

Use the SNMP Configuration screen to display and modify parameters for the Simple Network Management Protocol (SNMP). The product includes an onboard SNMP agent that monitors the status of its hardware as well as the traffic passing through its ports. A computer attached to the network, called a Network Management Station (NMS), can be used to access this information. Community strings control access

rights to the agent module. To communicate with the Device Server, the NMS must first submit a valid community string for authentication.

SNMP Configuration
System Name : RS232/422/485 Device Server & Converter
Location : Transition Networks
Contact name : techsupport@transition.com
Get Community : public
Set Community : private
[SNMP Trap]
Index Status IP address Community
1 Disabled 0.0.0.0 public
2 Disabled 0.0.0.0 public
3 Disabled 0.0.0.0 public
4 Disabled 0.0.0.0 public
5 Disabled 0.0.0.0 public
<SAVE> <ESC>
<Tab> to move ! <Enter> to select ! <Esc> to Cancel

The options for configuring community strings and related trap functions are described as below.

Use the <Tab> and <Enter> keys as previously. Enter the IP address of computers for when abnormalities on a connection occur and an alarm to be sent. Enter their community names and disable or enable their alarm function accordingly. See descriptions below:

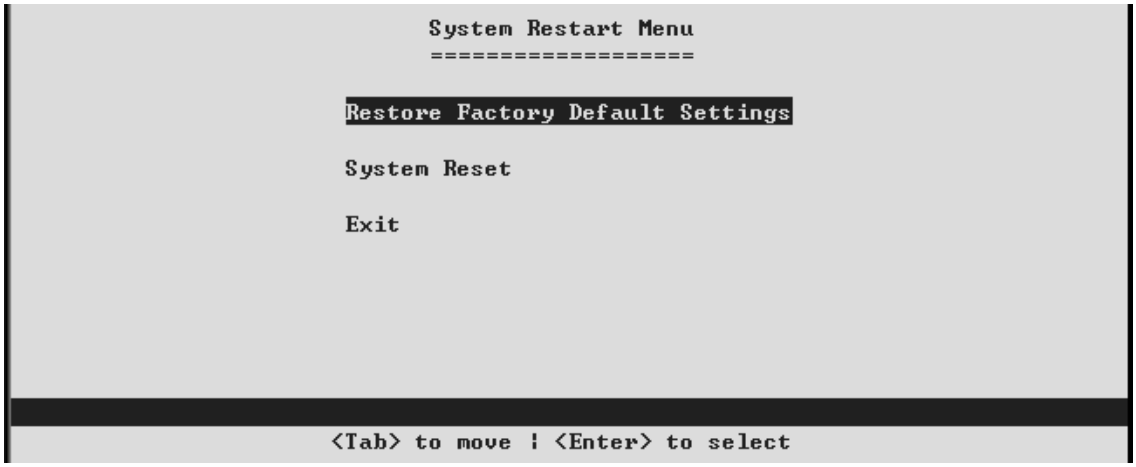
Parameter	Description
Index	Number assigned to each trap
Status	Disable or enable their alarm function accordingly
IP Address	Enter the IP address of computers for when abnormalities on a connection occur and an alarm to be sent. Enter their community names and disable or enable their alarm function accordingly
Community	Enter their community names

You can use an external SNMP-based application to configure and manage the Device Server. This management method requires the SNMP agent on the Device Server and the SNMP Network Management Station to use the same community string. This management method, in fact, uses two community strings: the get community string and the set community string. If the SNMP Network Management Station only knows the set community string, it can read and write to the MIBs. However, if it only knows

the get community string, it can only read MIBs. **The default Get and Set community strings for the product are public.**

6.1.8 System Restart Menu

This menu allows users to restore the factory default setting for the Device Server and/or to reset the system manually. Selecting this option will lead to another window with the following two options to select.



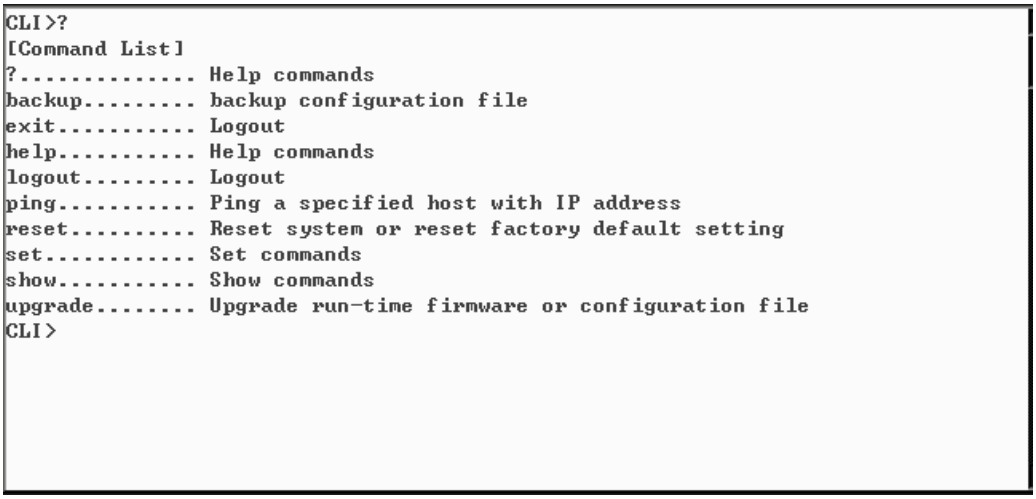
Restore Factory Default Settings
Selecting this option will lead to restore factory default settings to the Device Server. Highlight the field and hit the **<ENTER>** key to execute.

System Restart
The System Restart allows a user to perform a 'warm' restart and validate newly saved configuration to the Device Server. Highlight the System Restart field and hit the **<ENTER>** key to reset the unit.

After each configuration session, be sure to set DIP switch 1 to the 'OFF' position. Otherwise, the unit will not transmit any data.

6.2 Command Line Interface

Once you logged in and select the option of Command Line Interface, a window with command prompt will appear. Type **?** or **help** and it will show you the command list.



Command List

Command Definitions

backup: Use this command to save configuration settings to file.

exit: Type exit or logout and press **ENTER** to quit the program.

help: To access help commands list.

logout: To logout from the device server.

ping: Type **ping** followed by a **space**, and then the **IP address** of the device to send a test signal. If a response is received, then the device is connected. To view a full list of **ping** options, type ping and press **ENTER.**

reset: Type **reset config** and press **ENTER** to load factory default settings, or type **reset system** and press **ENTER** to restart the system.

show: Type **show** to display variety of device server settings.

set: To configure the management settings, type the commands below, followed by the **ENTER** key.

NOTE: Separate each port of the command line with a space.

set admin - follow the prompts to change user name and password

set eth0 - the command is for factory setting use **set eth0 ip** (new IP address) **network mask (**new network mask) **gateway** (new gateway). Use this command to set new Ethernet settings.

set idle - (time in seconds) **–** set automatic logout. when the program or communication is idle

set xfer - the command is for RS-232 configuration and data communication setting. The command syntax is as below.

set xfer [arg_1 data_1] [arg_2 data_2] ...
[arg_n data_n]
[Argument List]
Port..... Set TCP port number
statistics..... Clear statistics

upgrade - Use this command to upgrade the firmware.
i.e upgrade firmware xxx.xxx.xxx.xxx Soft2.bin

set snmp - Use this command to set SNMP settings of the device server.

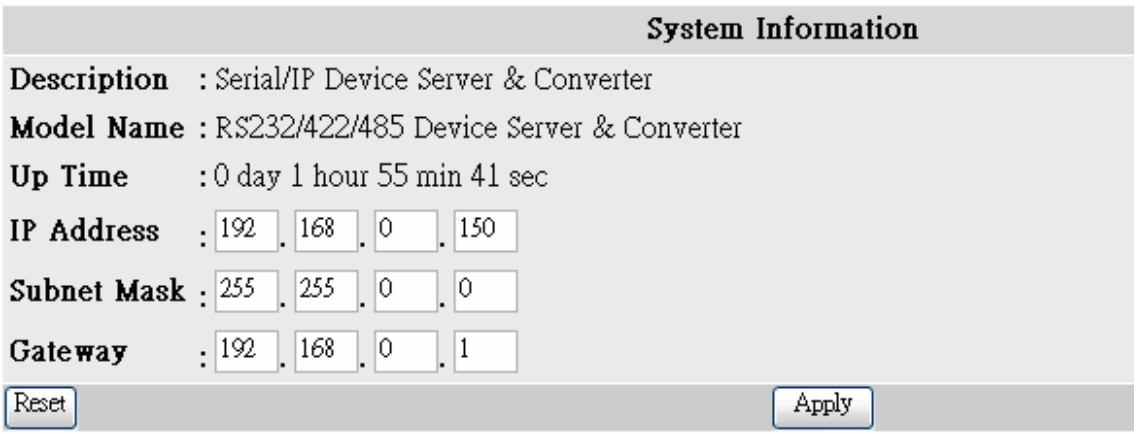
After each configuration session, be sure to set DIP switch 1 to the 'OFF' position. Otherwise, the unit will not transmit any data.

6.3 Web Graphic User Interface

Please see previous chapter to log-in the Device Server via web browser.

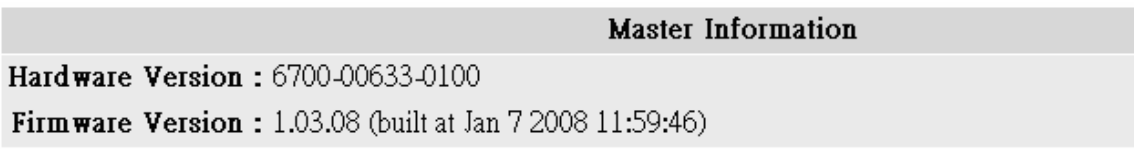
6.3.1 System Information

System information will show IP Address, Subnet Mask and Gateway settings. After editing the setting press **Apply** to implement the settings.


System Information
Description : Serial/IP Device Server & Converter
Model Name : RS232/422/485 Device Server & Converter
Up Time : 0 day 1 hour 55 min 41 sec
IP Address : 192 . 168 . 0 . 150
Subnet Mask : 255 . 255 . 0 . 0
Gateway : 192 . 168 . 0 . 1
Reset
Apply

6.3.2 Master Information

Master Info will show the hardware and firmware version.



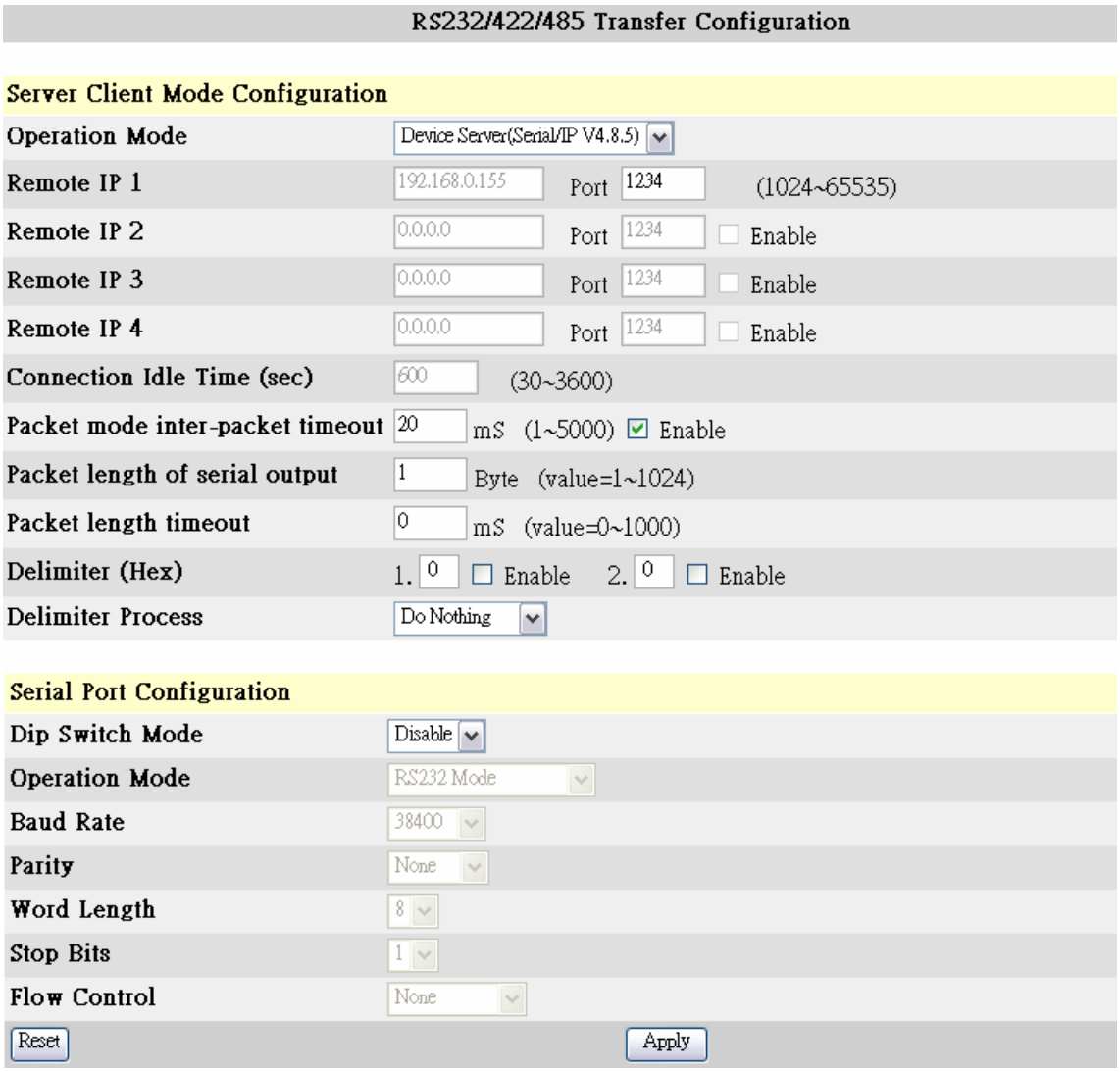
6.3.3 Serial Port Configuration

This page lets you configure the communication model and operation mechanism of the Device Server. Please select the appropriate mode as required for your application. The user can also monitor the serial port status and configure TCP port numbers from this menu.

A. The unit offers six modes (TCP Server / TCP Client / Converter / UDP Server / UDP Client / Device Server). Please restart the unit after selecting the desired mode.

Note: If you use Converter Mode, we recommend that you **Disable** the Packet Mode option.

A detailed explanation of the setting choices is given underneath the following screenshot – this is followed by diagrams and descriptions of the different network setups and operating modes.



EXPLANATION: Server/Client Mode Configuration	
Operation Mode	**TCP Server:** the TCP Server mode of the Device Server allows TCP connections from up to four Device Servers with TCP Client mode or PC with Serial IP Redirector program running. **TCP Client:** the TCP Client mode of the Device Server can establish up to four TCP connections with Device Servers of TCP

	Server mode. **UDP Server:** the UDP Server mode of the Device Server allows the communication initiated from up to four UDP Clients. **UDP Client:** the UDP Client mode can communicate with up to four UDP Servers in UDP communication model. **Device Server (Serial/IP v4.8.5):** use Serial IP Redirector v4.8.5 to remote connects to the Device Server as Server role of RFC-2217 COM Port Control Protocol. **Device Server (Serial/IP v4.6.2):** use Serial IP Redirector v4.6.2 to remote connects to the Device Server as Server role of RFC-2217 COM Port Control Protocol. **Converter Mode:** two Device Servers communicate with each other through point-to-point architecture in TCP communication model. The TCP Client and Server roles of two Device Server peers are negotiated automatically.
Remote IP 1~4	IP addresses of the other end device or Serial IP Redirector workstations.
Port	The TCP port number corresponding to each remote IP that the TCP Server is bound to.
Status	Toggle between “Enable” and “Disable” for activating or deactivating the second to the fourth remote IP/Port entries.
Connection Idle Time	In seconds. The TCP Server or Client will disconnect the TCP session if no packets are transmitted in the set period.
Packet mode (serial)	Enabled – input data from the serial interface is treated as serial packets. Disabled – input data from the serial interface is treated as bit streams.
Packet mode inter-packet timeout	In milliseconds. The delimiter value for recognizing the timeout gap between serial packets if Packet Mode is enabled.
Packet length of serial output	In bytes. The length of a serial packet for Device Server to delimit among data stream from IP network.
Packet length timeout	In milliseconds. When the accumulated bytes do not exceed the “Packet length of serial output” and the specified “Packet length timeout” value is reached, a serial packet is formed and sent out.
Delimiter1(Hex)/ Status	Besides the inter-packet timeout, serial packets can be delimited by one or two trailer bytes of specific values. Delimiter 1 is the hexadecimal number of the first delimiter byte. Toggle to “Enable” on the “Status” field for delimiting serial packets according to trailer byte rather than inter-packet timeout.
Delimiter2(Hex)/ Status	The hexadecimal number of the second delimiter byte. If this byte is “Disable” and the Delimiter 1 is “Enable”, the delimiter byte length is one.
Serial Port Configuration	
DIP Switch Mode	Enable: use software management interface to set serial interface configurations. Disable: use DIP Switch to set serial interface configurations.
Operation Mode	A read-only attribute. It shows the RS232/422/485 mode set by the DIP switch.
Baud Rate	The speed of the serial interface.
Parity	Select or disable the parity checking method
Word Length	The length of data in bits
Stop Bits	The bit length of stop bits
Flow Control	The flow control method for informing the correspondent

While using as Device Server mode, in case you are using a serial device with a 2-wire RS-485 application or Modbus RTU protocol, do not forget to “Enable” the “Packet” mode of serial input. Also enter the appropriate inter-packet timeout or delimiter byte values to enable smooth data communication.

Note: You will not be able to change the serial port settings (Baud Rate, Parity, Stop bits etc) while working in Device Server mode; they are managed through IP Serial Redirector software.

Applications for Operation Modes:

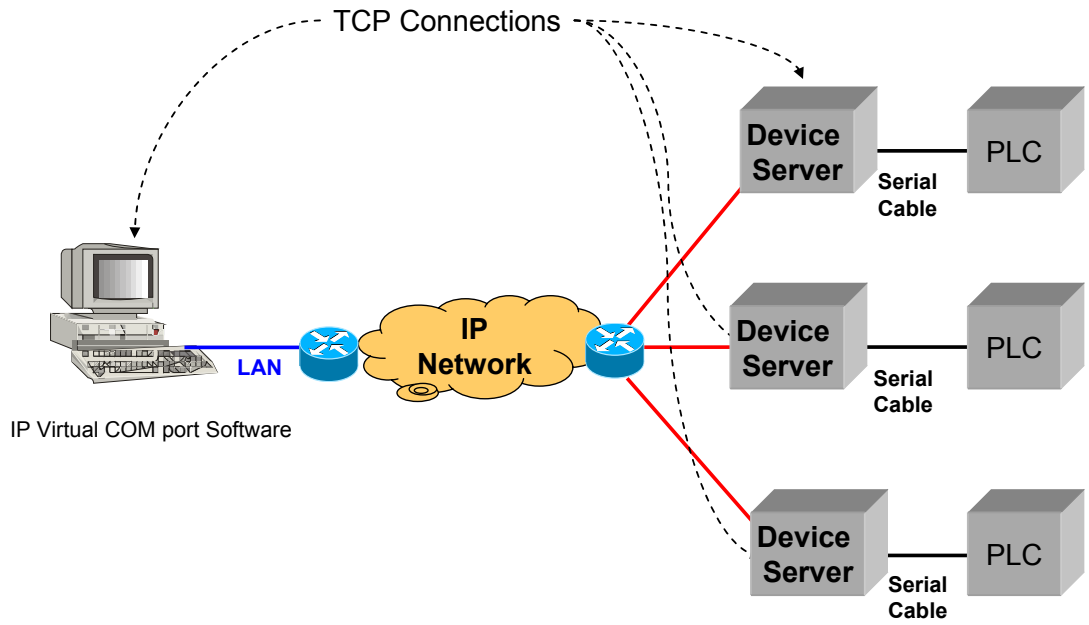


Diagram 1 – Central Management Application (Device Server Mode)

Device Server Mode: In this mode the Device Server acts in the Server role of the RFC-2217 COM Port Control Protocol.

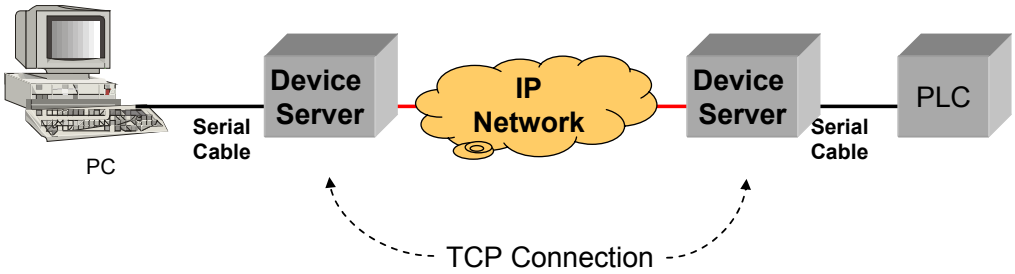


Diagram 2 – Peer-to-Peer Application (Converter Mode)

Converter Mode: In this mode the Device Server/Managed Media Converter acts like an advanced media converter. Like a normal converter, the Device Server/Managed Media Converter communicates with a remote Device Server/Managed Media Converter in a peer-to-peer way. Also, the Device Servers communicate with each other through an IP network in the TCP communication model. The TCP Client and Server roles of the two Device Server peers are negotiated automatically.

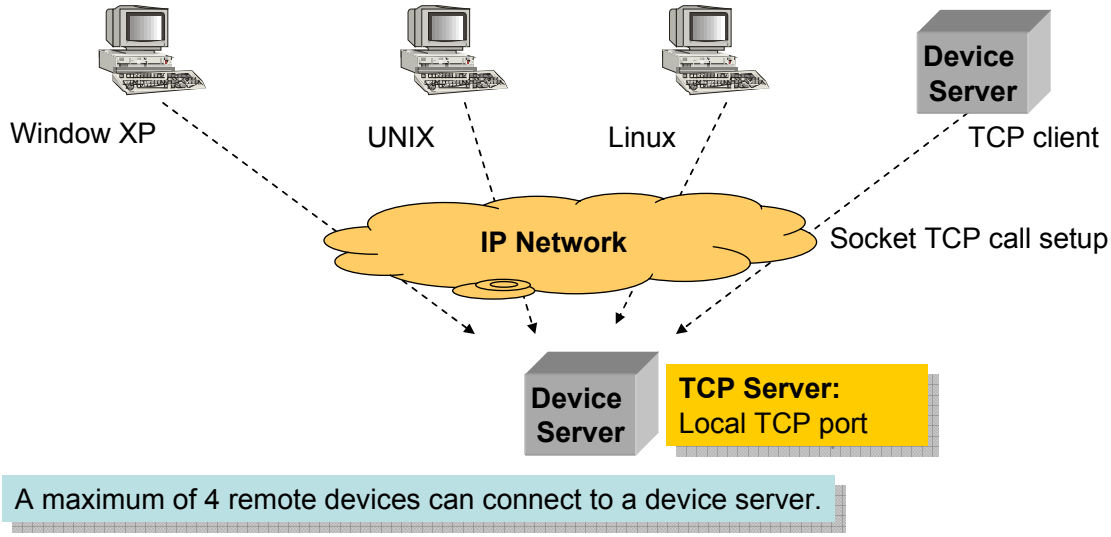


Diagram 3 – Multi-host Application (TCP Server mode)

TCP Server Mode: In this mode the Device Server/Managed Media Converter acts as a device server and functions as a network agent for the serial device. For example, when a serial device with a serial console port is connected to the Device Server/Managed Media Converter while it is in TCP Server mode, the console port becomes a network-accessible interface via the Device Server/Managed Media Converter device server. In TCP Server Mode, the Device Server/Managed Media Converter device server can link the serial device and a TCP-operating control host by providing two-way transmission between the two.

In TCP **Server** mode, the Device Server/Managed Media Converter **waits** for the control host to initiate communication with the serial device. Conversely, in TCP **Client** mode (next diagram) the Device Server/Managed Media Converter **initiates** communication with one or up to four remote devices simultaneously – when the serial device experiences a communication event and prompts the Device Server/Managed Media Converter to initiate communication.

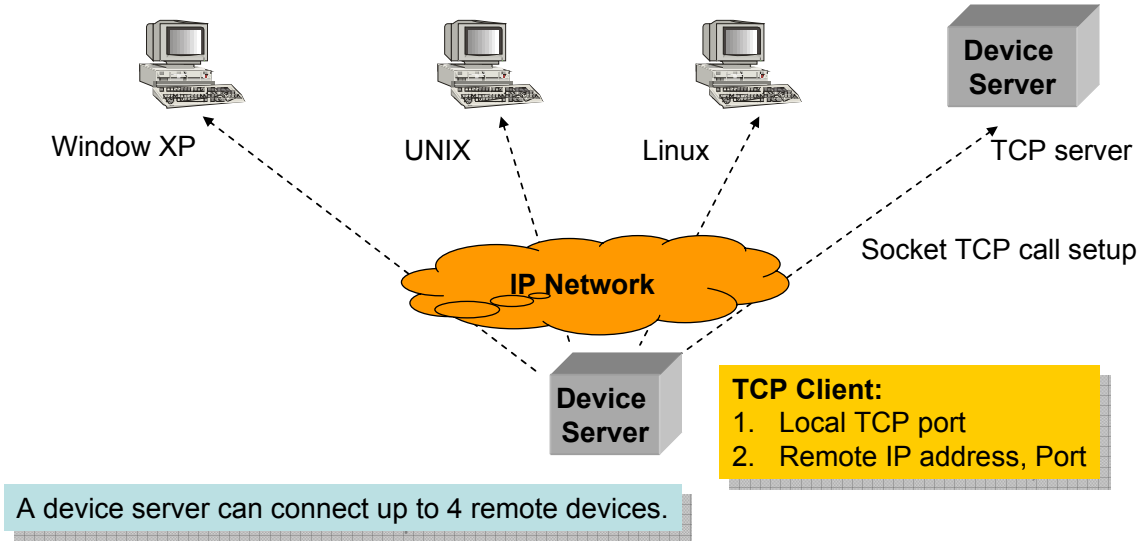


Diagram 4 – Multi-host Application (TCP Client mode)

TCP Client Mode: This mode lets the Device Server/Managed Media Converter act as a bridge for serial devices that must communicate with server hosts like the Linux, Unix and Windows systems. In this Client mode, the Device Server establishes a temporary TCP connection with the servers automatically after powering up. All the data received from the serial device is then sent to remote servers. The servers can also send data back to the serial device while the connection is active. The Device Server/Managed Media Converter automatically ends the connection when all information is sent and the connection becomes idle for a specified length of time. It will reestablish the connection when it receives data from the serial device.
In TCP **Server** mode (previous section), the Device Server/Managed Media Converter **waits** for the control host to initiate communication with the serial device. Conversely, in TCP **Client** mode the DEVICE SERVER/MANAGED MEDIA CONVERTER **initiates** communication with one or up to four remote devices simultaneously – when the serial device experiences a communication event and prompts the DEVICE SERVER/MANAGED MEDIA CONVERTER to initiate communications.

6.3.4 Serial Connect Status

Serial Connect Status will show the serial port connection to the serial device. Serial port settings can only be changed when using Media Converter mode.

RS232/422/485 Connection Status

Port Number	1	2	3	4
Connect Status	Not-Connected	Not-Connected	Not-Connected	Not-Connected
Peer IP Address	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0
Dest/Srce Port Number	0 / 0	0 / 0	0 / 0	0 / 0
Byte Counts From UART	273			
Byte Counts To Network	255	0	0	0
Byte Counts From Network	9992	0	0	0
Byte Counts To UART	9992			

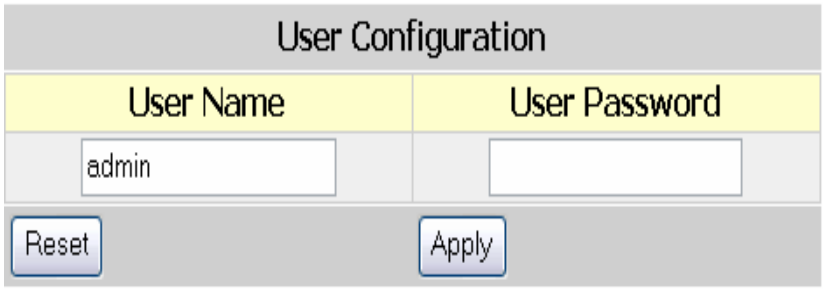
Clear

User can get the instant information about the connectivity.

Connect Status: Server or Client
Peer IP Address: IP of remote PC access the serial device via Device Server
Dest/Srce Port Number: Showing the destination and source Port numbers. Source port number will be as configured.
Byte Counts From UART: Displaying the number of bytes transmitted from serial device.
Byte Counts to Network: Displaying the number of bytes received to TCP/IP network.
Byte Counts From Network: Displaying the number of bytes transmitted from Network.
Byte Counts to UART: Displaying the number of bytes received to serial device.
Mgmt. Configuration
This category offers multiple management options.

6.3.5 User Configuration

This option will allow user to change the “username” and “user password” for the Device Server management.

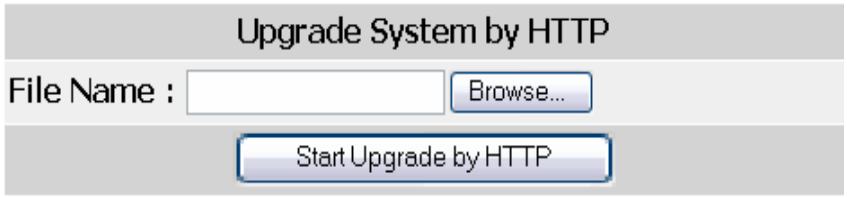


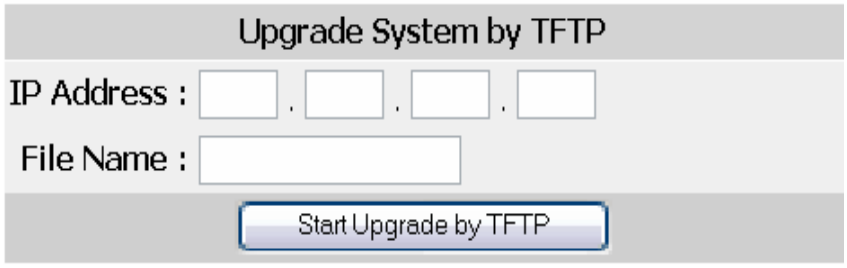
Type the new user name in the “User Name” and password to “User Password”. Selecting **Apply** will implement the new user name and password, which will be required to manage the Device Server.

It is recommended to keep a written record in a safe place for the User Name and Password. In case, you lost the both or either one, you need to reset the system to default setting. This can be done by pressing a button at S1 location of PCB (near to capacitor) after removing the casing.

6.3.6 Firmware Download

The user can download the newer/latest firmware to upgrade the Device Server once available. The user has two options, either they can upgrade via HTTP with browse option to select the firmware file.



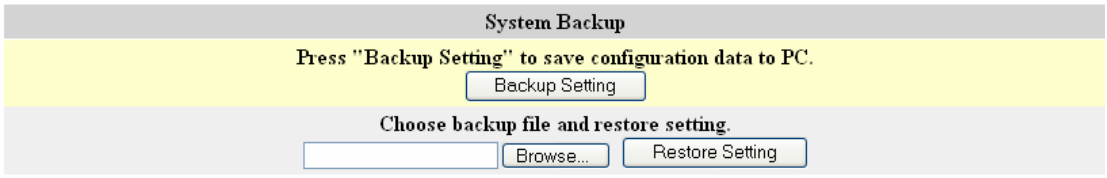


If using TFTP method, user must provide the valid IP address of TFTP server and the file name.

Once enter the parameters press “Start Upgrade by HTTP / TFTP” to upgrade the firmware. The window will appear to show the time to before restarting the device server to implement the upgraded firmware. For ensuring correct parameter values for Device to be functioning after firmware upgrade from a prior version with different configuration structure and data format, please Restore Factory Default Settings in System Restart Menu.

6.3.7 Configuration File Backup and Restore

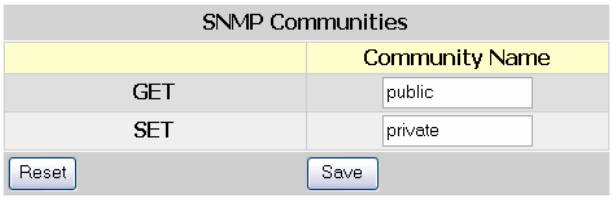
The user can backup configuration settings in a file or restore the settings saved in file to device server.



For backup system configurations, click the button “Backup Setting” and then choose the file path and file name. For restore system configurations, click the button “Browse…” to choose the backup file for restoring and then click the button “Restore Setting” to start the configuration restoring.

6.3.8 SNMP Community Configuration

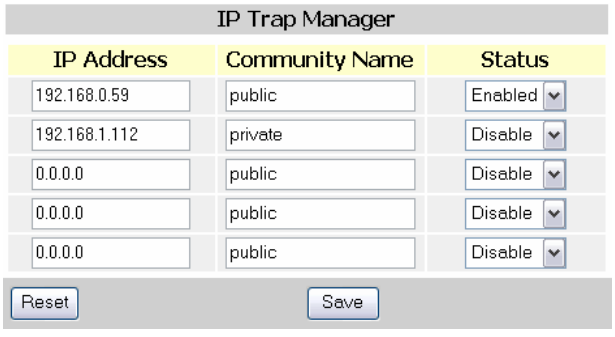
You can use an external SNMP-based application to configure and manage the Device Server. This management method requires the SNMP agent on the Device Server and the SNMP Network Management Station to use the same community string. This management method, in fact, uses two community strings: the **Get** community string and the **Set** community string. If the SNMP Network Management Station only knows the **Set** community string, it can read and write to the MIBs. However, if it only knows the **Get** community string, it can only read MIBs. The default **Get** and **Set** community strings for the Device Server are public and private respectively.



If needed, assign the new parameters and press **Save** to implement the settings.

6.3.9 IP Trap

The following figure and table describe how to specify management stations that will receive authentication failure messages or other trap messages from the Device Server. Up to 5 trap managers may be assigned.



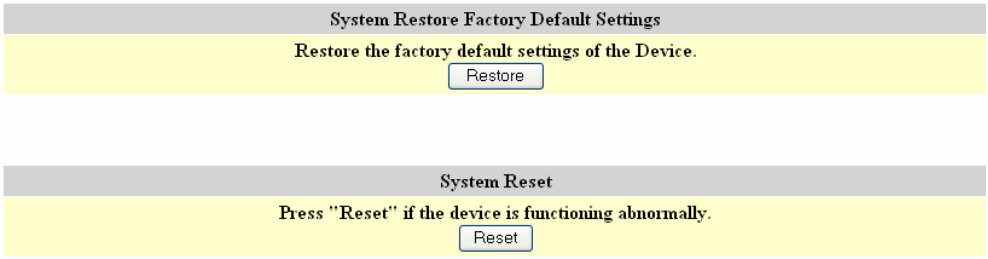
Click on each parameter field to modify the desired setting, then click on **Undo** to restore previously saved configurations or click on **Save** to retain newly entered information. See descriptions below:

Parameter	Description
IP Address	Enter the IP address of terminals for when abnormalities on a connection occur and an alarm to be sent. Enter their community names and disable or enable their alarm function accordingly
Community Name	Enter their community names
Status	Disable or enable their alarm function

6.3.10 System Restart

Users can restart/reset the system via software from a remote location.

Restart Options


System Restore Factory Default Settings
Restore the factory default settings of the Device.
Restore
System Reset
Press "Reset" if the device is functioning abnormally.
Reset

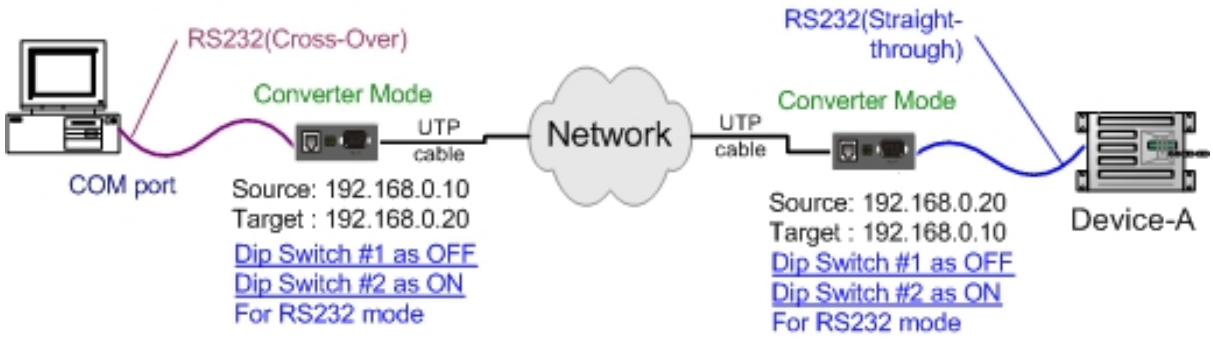
Clicking on the Restore button will set the Device Server back to factory defaults. All saved configurations will be lost.

Appendix: RS-232 Cable Connection Diagram

Part 1. The Connection Diagram

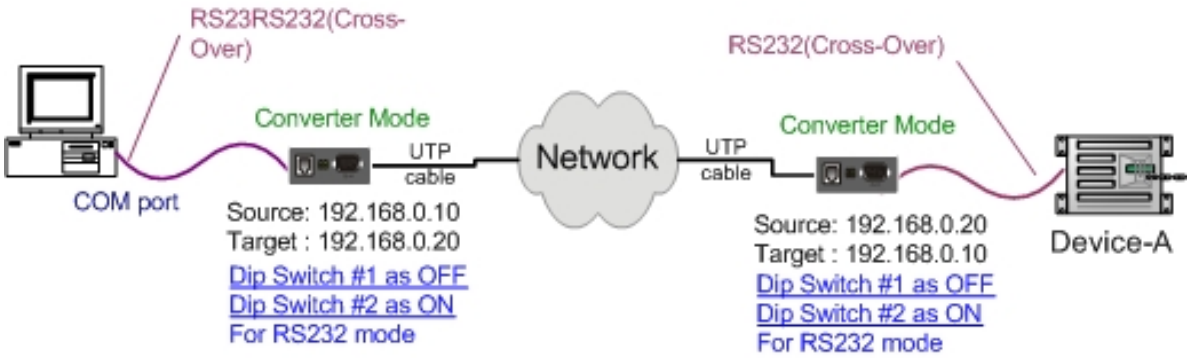
Case i. PC connect to Device by Straight-through RS232 cable

After connection with one paired devices in converter mode

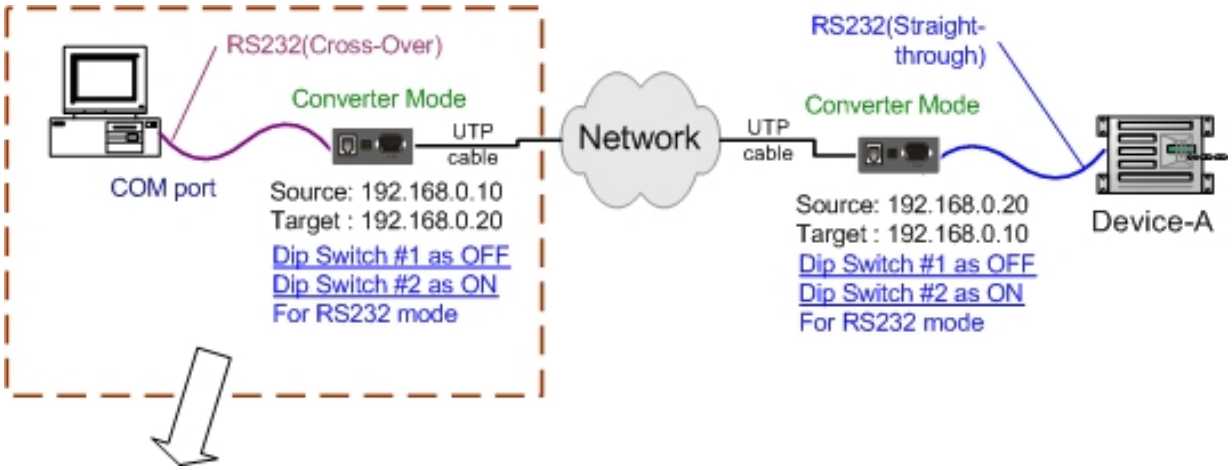


Case ii. PC connect to Device by Cross-over RS232 cable

After connection with one paired devices in converter mode



Part 2. Configure Device Server in Converter-mode by using the Console Port



0. Parameters of Device Server

Example

i. Local(Source) IP address

IP address : 192.168.0.10 / 255.255.255.0
Gateway : 192.168.0.1

ii. Remote(Target) IP address

Remote IP address : 192.168.0.20

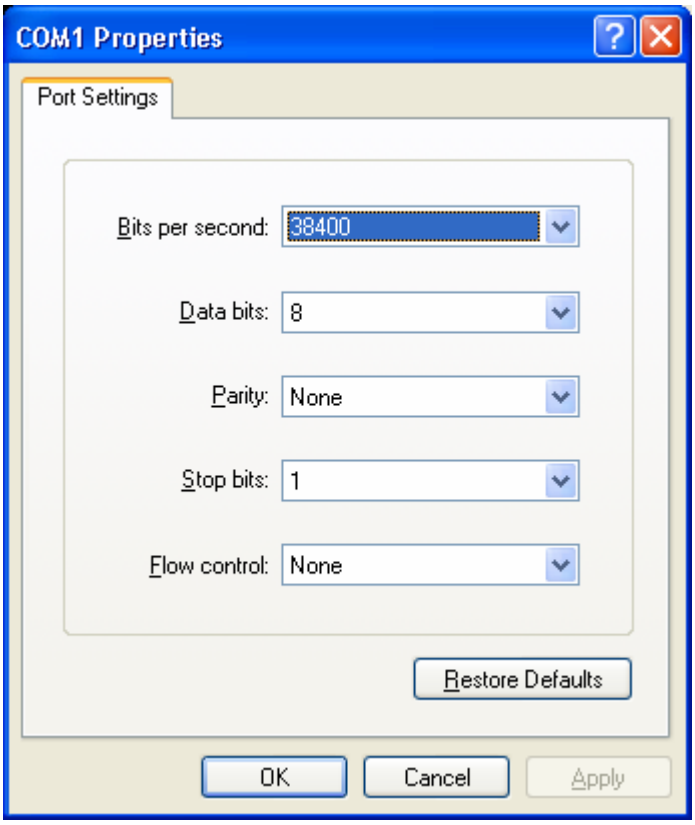
iii. Data mode and transmission parameters

Mode : RS232

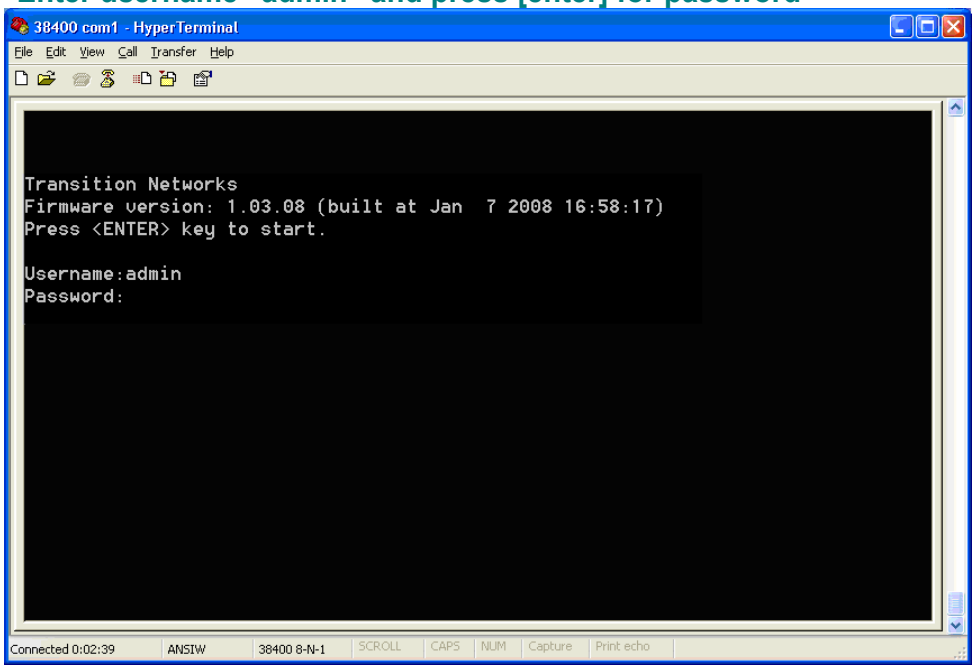
baud : 38,400
data bit : 8
parity check : none
stop bit : 1
flow control : No

The connection diagram

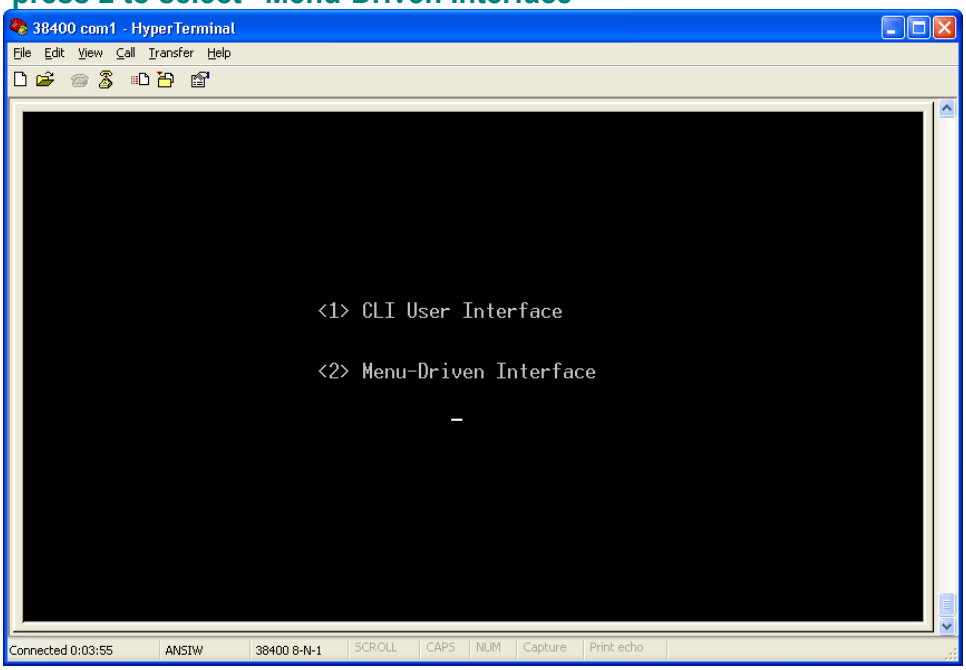
1. set dip switch #1 as ON for the “Console Mode”
2. connect PC and Device Server with an RS232 Cross-Over cable
3. setup HyperTerminal parameters as below
   - baud : 38,400
   - data bit : 8
   - parity check : none
   - stop bit : 1
   - flow control : No



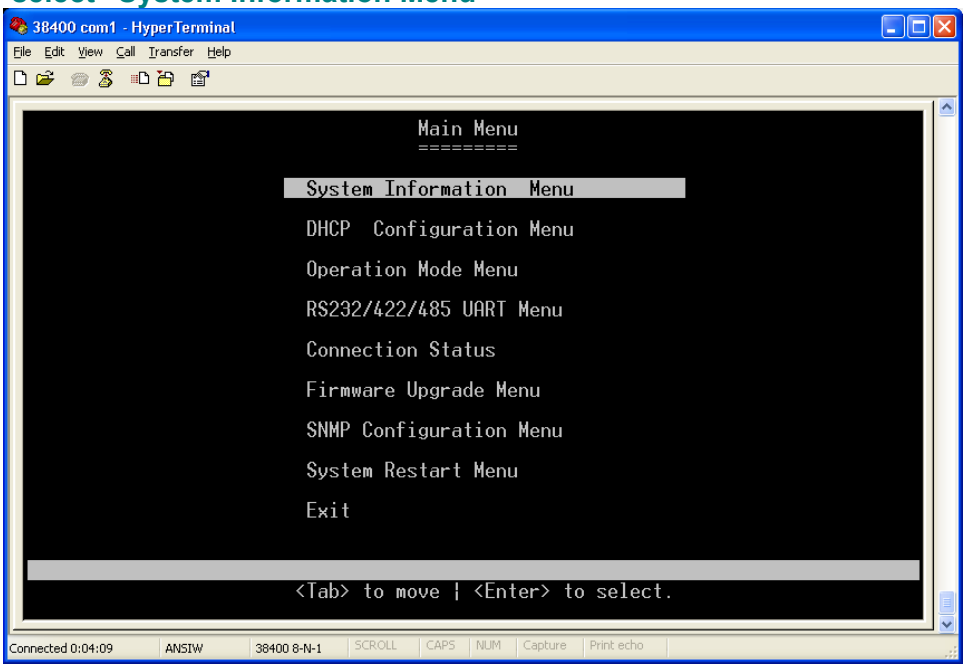
4. Enter username “admin” and press [enter] for password



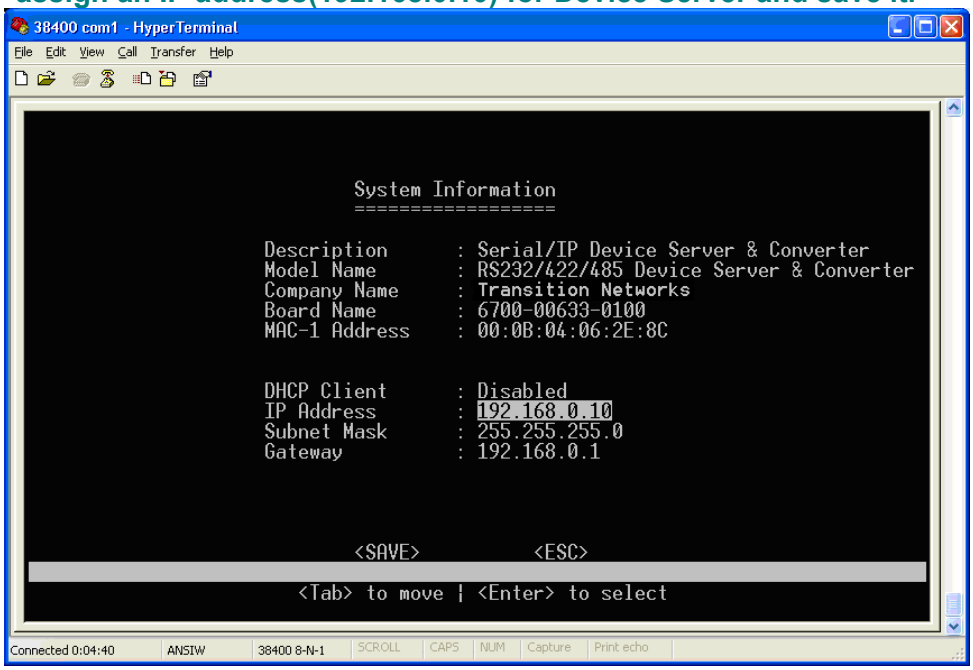
5. press 2 to select “Menu-Driven Interface”

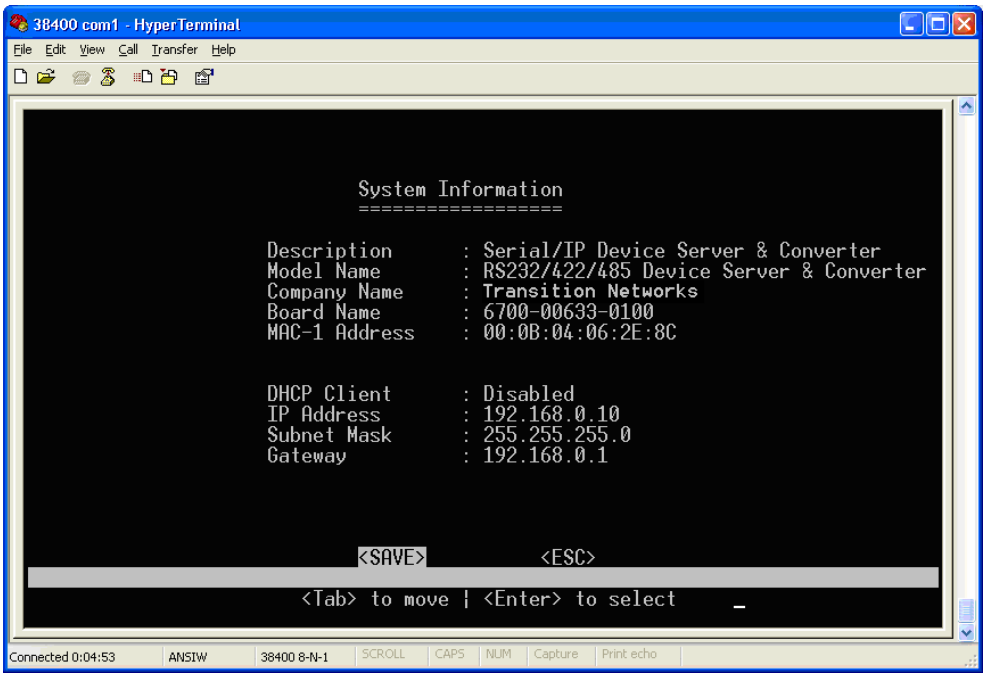


6. select “System Information Menu”



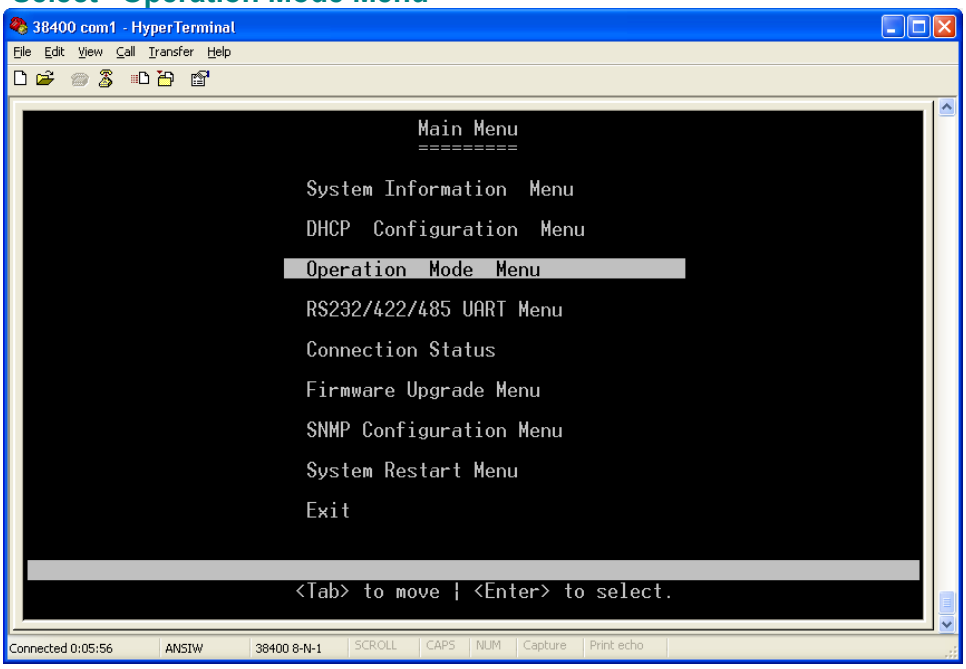
7. assign an IP address(192.168.0.10) for Device Server and save it.


38400 com1 - HyperTerminal
File Edit View Call Transfer Help
System Information
Description : Serial/IP Device Server & Converter
Model Name : RS232/422/485 Device Server & Converter
Company Name : Transition Networks
Board Name : 6700-00633-0100
MAC-1 Address : 00:0B:04:06:2E:8C
DHCP Client : Disabled
IP Address : 192.168.0.10
Subnet Mask : 255.255.255.0
Gateway : 192.168.0.1
<SAVE> <ESC>
<Tab> to move | <Enter> to select
Connected 0:04:40 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

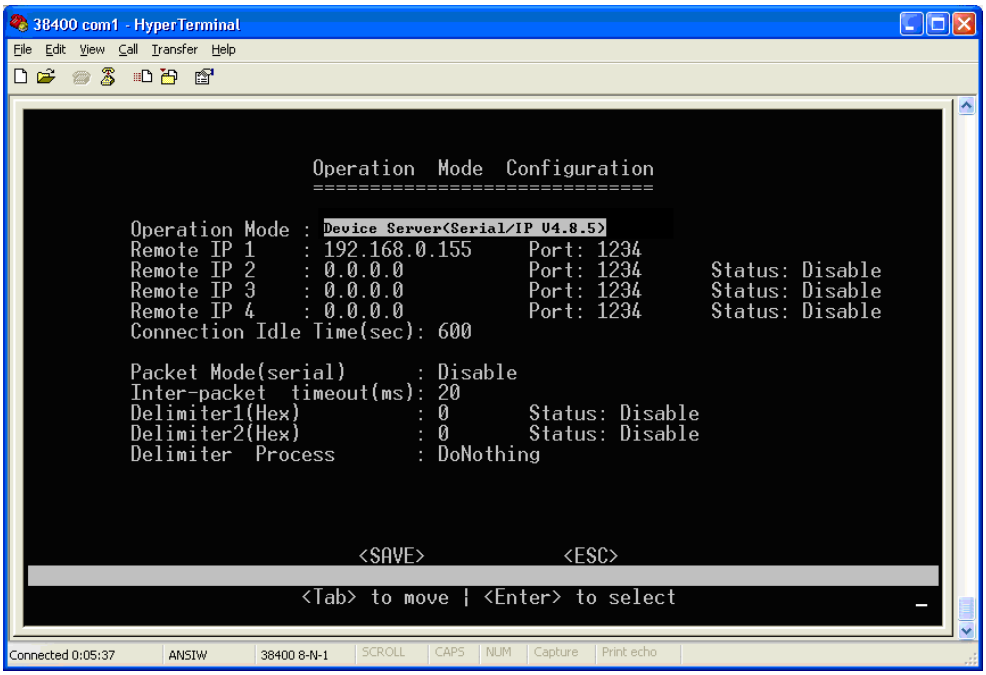

38400 com1 - HyperTerminal
File Edit View Call Transfer Help
System Information
Description : Serial/IP Device Server & Converter
Model Name : RS232/422/485 Device Server & Converter
Company Name : Transition Networks
Board Name : 6700-00633-0100
MAC-1 Address : 00:0B:04:06:2E:8C
DHCP Client : Disabled
IP Address : 192.168.0.10
Subnet Mask : 255.255.255.0
Gateway : 192.168.0.1
<SAVE> <ESC>
<Tab> to move | <Enter> to select
Connected 0:04:53 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

***** After saving the IP address then the device will re-boot

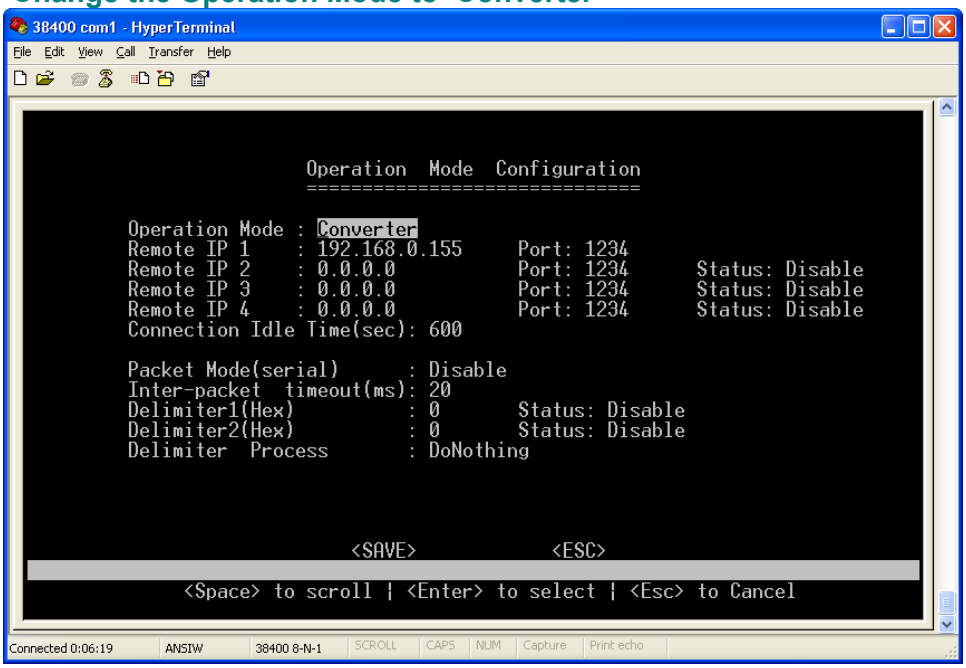
8. Select “Operation Mode Menu”



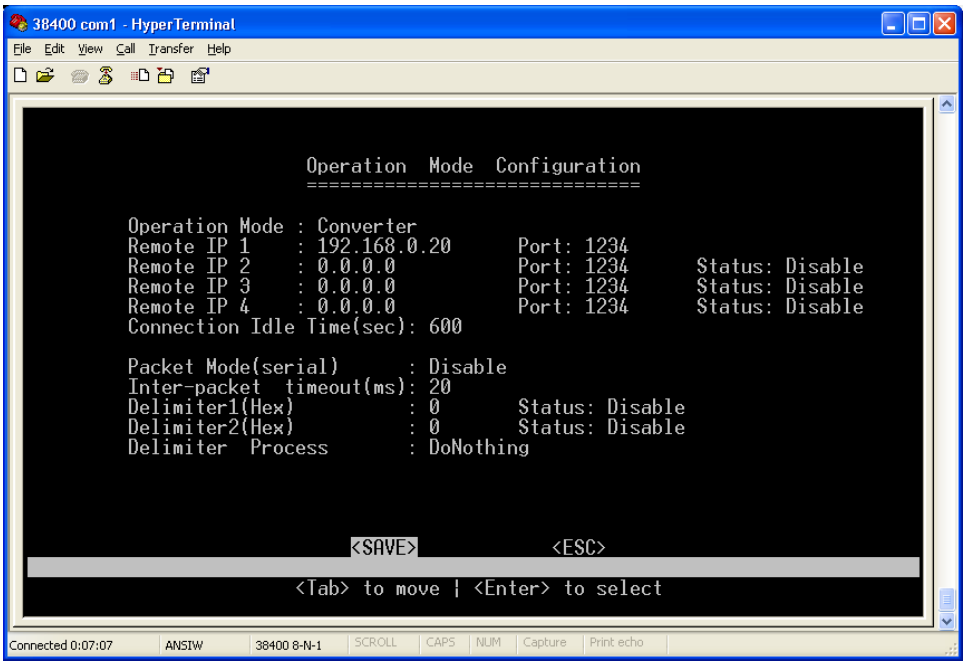
The default setting of Operation Mode is 'Device Server'


38400 com1 - HyperTerminal
File Edit View Call Transfer Help
Operation Mode Configuration
Operation Mode : Device Server(Serial/IP V4.8.5)
Remote IP 1 : 192.168.0.155 Port: 1234
Remote IP 2 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 3 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 4 : 0.0.0.0 Port: 1234 Status: Disable
Connection Idle Time(sec): 600
Packet Mode(serial) : Disable
Inter-packet timeout(ms): 20
Delimiter1(Hex) : 0 Status: Disable
Delimiter2(Hex) : 0 Status: Disable
Delimiter Process : DoNothing
<SAVE> <ESC>
<Tab> to move | <Enter> to select
Connected 0:05:37 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

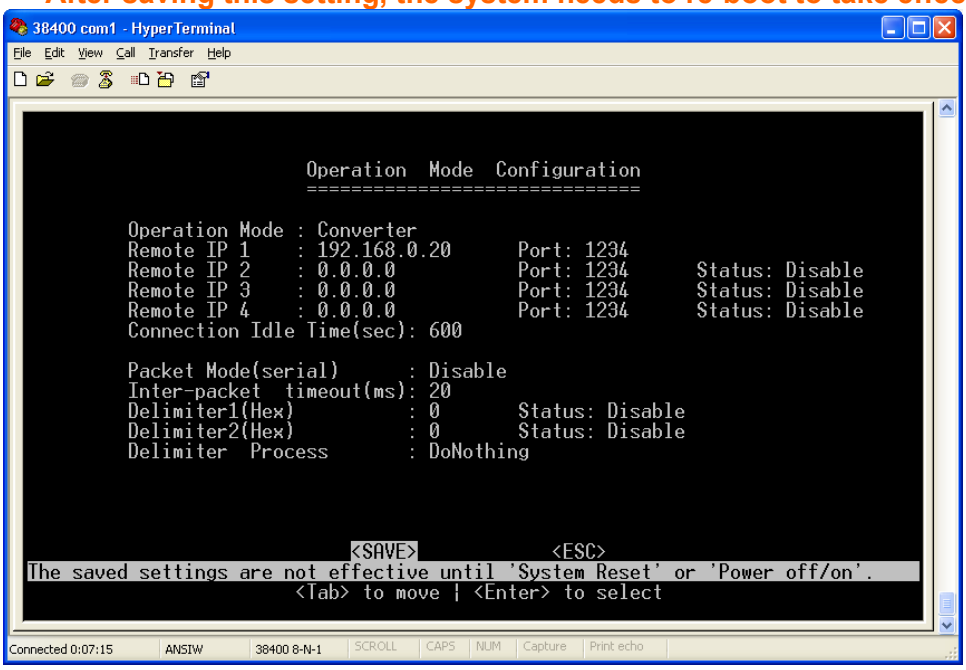
9. Change the Operation Mode to 'Converter'


38400 com1 - HyperTerminal
File Edit View Call Transfer Help
Operation Mode Configuration
Operation Mode : Converter
Remote IP 1 : 192.168.0.155 Port: 1234
Remote IP 2 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 3 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 4 : 0.0.0.0 Port: 1234 Status: Disable
Connection Idle Time(sec): 600
Packet Mode(serial) : Disable
Inter-packet timeout(ms): 20
Delimiter1(Hex) : 0 Status: Disable
Delimiter2(Hex) : 0 Status: Disable
Delimiter Process : DoNothing
<SAVE> <ESC>
<Space> to scroll | <Enter> to select | <Esc> to Cancel
Connected 0:06:19 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

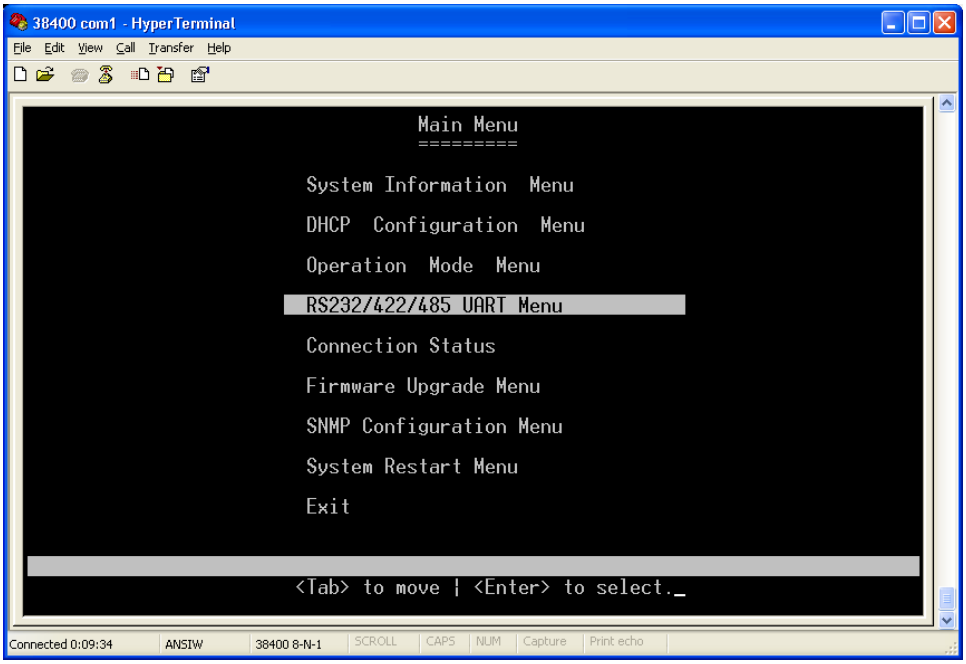
10. Change Remote IP for 192.168.0.20


38400 com1 - HyperTerminal
File Edit View Call Transfer Help
Operation Mode Configuration
Operation Mode : Converter
Remote IP 1 : 192.168.0.20 Port: 1234
Remote IP 2 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 3 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 4 : 0.0.0.0 Port: 1234 Status: Disable
Connection Idle Time(sec): 600
Packet Mode(serial) : Disable
Inter-packet timeout(ms): 20
Delimiter1(Hex) : 0 Status: Disable
Delimiter2(Hex) : 0 Status: Disable
Delimiter Process : DoNothing
<SAVE> <ESC>
<Tab> to move | <Enter> to select
Connected 0:07:07 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

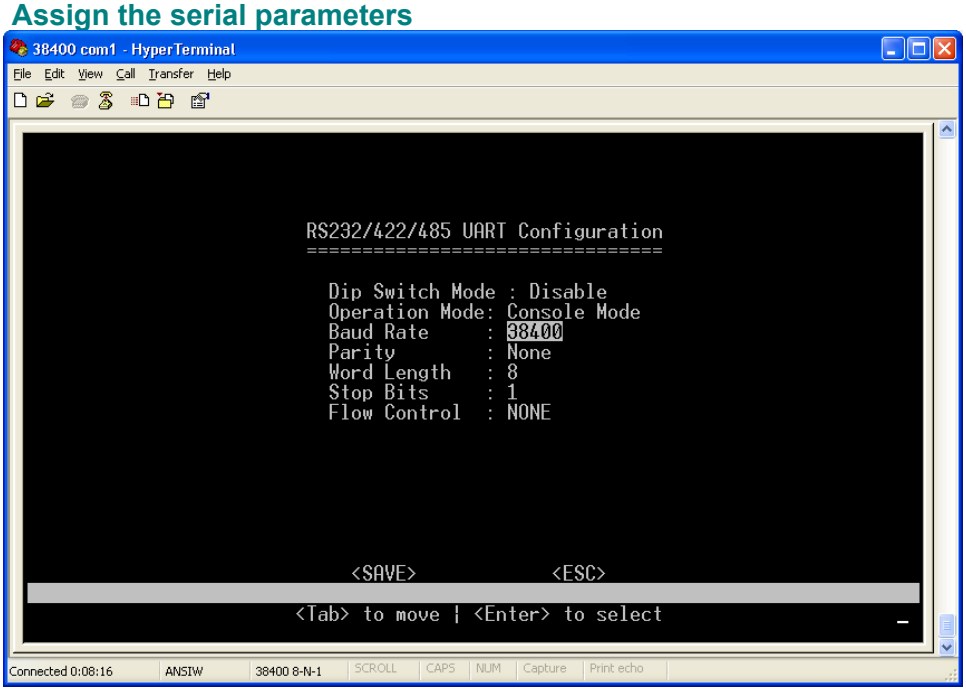
***** After saving this setting, the system needs to re-boot to take effect


38400 com1 - HyperTerminal
File Edit View Call Transfer Help
Operation Mode Configuration
Operation Mode : Converter
Remote IP 1 : 192.168.0.20 Port: 1234
Remote IP 2 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 3 : 0.0.0.0 Port: 1234 Status: Disable
Remote IP 4 : 0.0.0.0 Port: 1234 Status: Disable
Connection Idle Time(sec): 600
Packet Mode(serial) : Disable
Inter-packet timeout(ms): 20
Delimiter1(Hex) : 0 Status: Disable
Delimiter2(Hex) : 0 Status: Disable
Delimiter Process : DoNothing
<SAVE> <ESC>
The saved settings are not effective until 'System Reset' or 'Power off/on'.
<Tab> to move | <Enter> to select
Connected 0:07:15 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

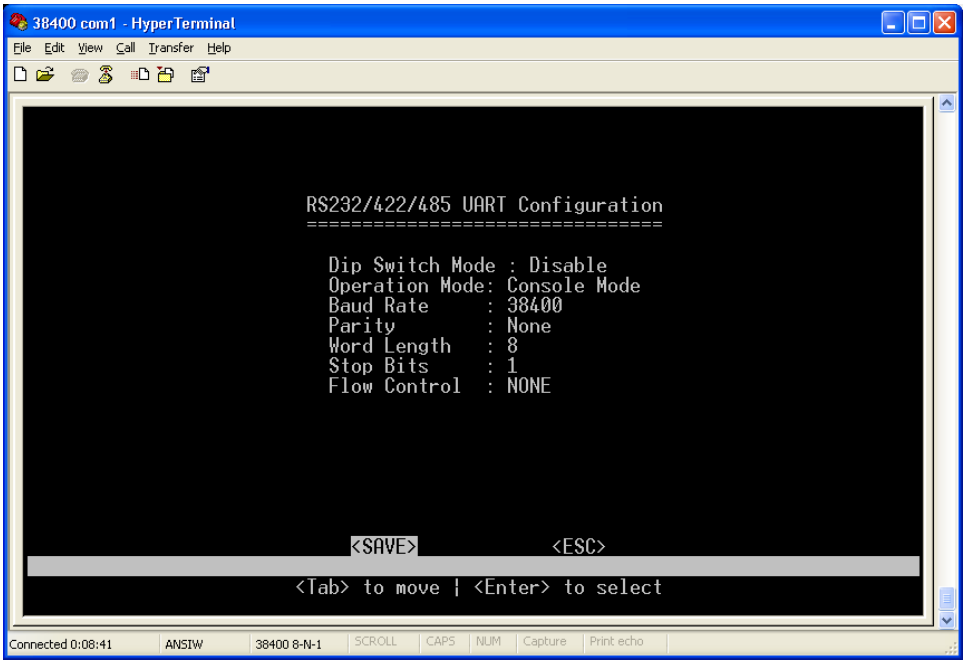
11. choose “RS232/422/485 UART Menu”

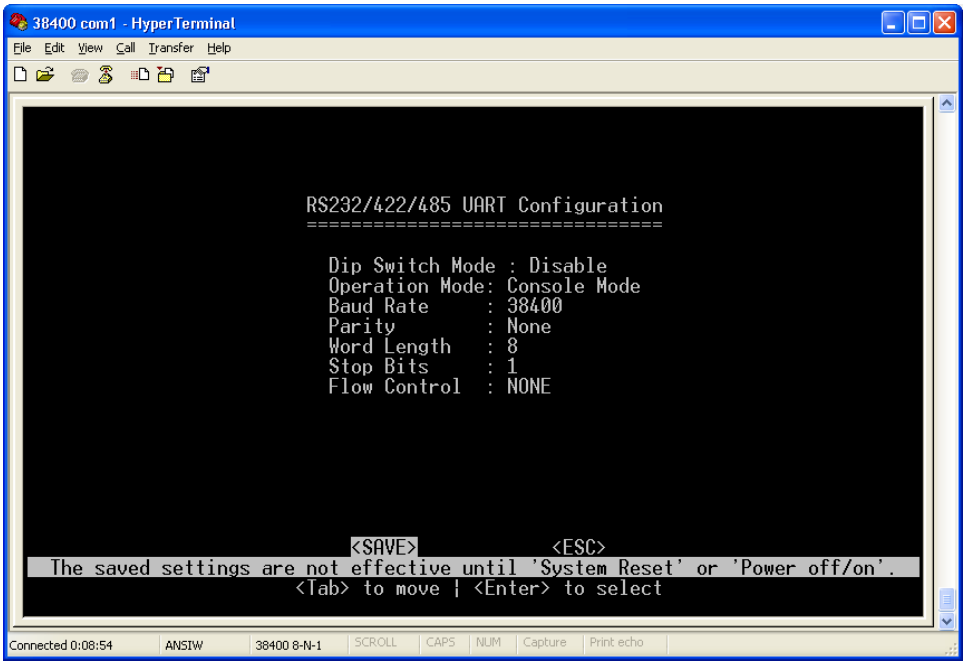


12. Assign the serial parameters


38400 com1 - HyperTerminal
File Edit View Call Transfer Help
RS232/422/485 UART Configuration
Dip Switch Mode : Disable
Operation Mode: Console Mode
Baud Rate : 38400
Parity : None
Word Length : 8
Stop Bits : 1
Flow Control : NONE
<SAVE> <ESC>
<Tab> to move ¦ <Enter> to select
Connected 0:08:16 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

13. After saving this setting, the system needs to re-boot to take effect


38400 com1 - HyperTerminal
File Edit View Call Transfer Help
RS232/422/485 UART Configuration
Dip Switch Mode : Disable
Operation Mode: Console Mode
Baud Rate : 38400
Parity : None
Word Length : 8
Stop Bits : 1
Flow Control : NONE
<SAVE> <ESC>
<Tab> to move | <Enter> to select
Connected 0:08:41 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

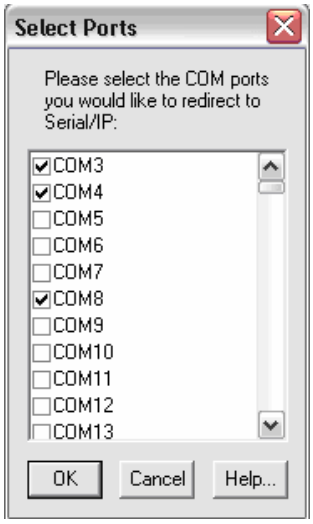

38400 com1 - HyperTerminal
File Edit View Call Transfer Help
RS232/422/485 UART Configuration
Dip Switch Mode : Disable
Operation Mode: Console Mode
Baud Rate : 38400
Parity : None
Word Length : 8
Stop Bits : 1
Flow Control : NONE
<SAVE> <ESC>
The saved settings are not effective until 'System Reset' or 'Power off/on'.
<Tab> to move | <Enter> to select
Connected 0:08:54 ANSIW 38400 8-N-1 SCROLL CAPS NUM Capture Print echo

14. After finishing these settings, the DIP switch #1 has to be changed back to 'Data Communications' mode as required.
ex: position 2 set as ON means the serial port set as RS232 mode.

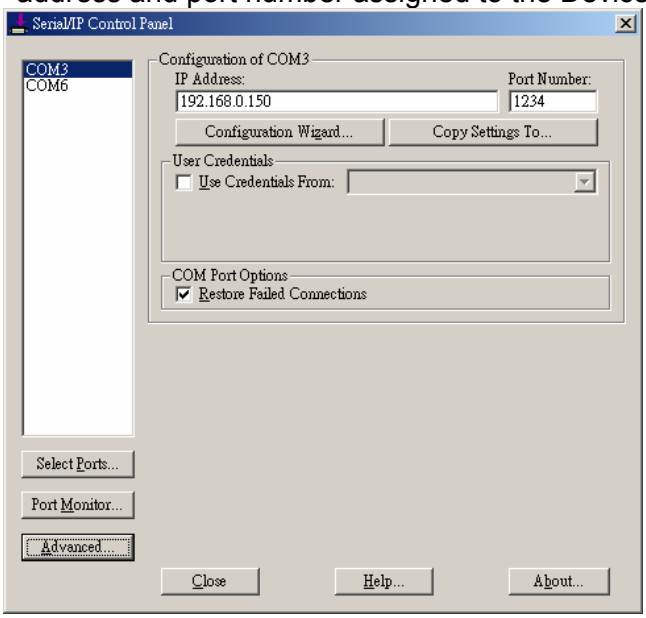
Dip Switch #1 as OFF
Dip Switch #2 as ON
For RS232 mode

Appendix B: Serial IP Redirector

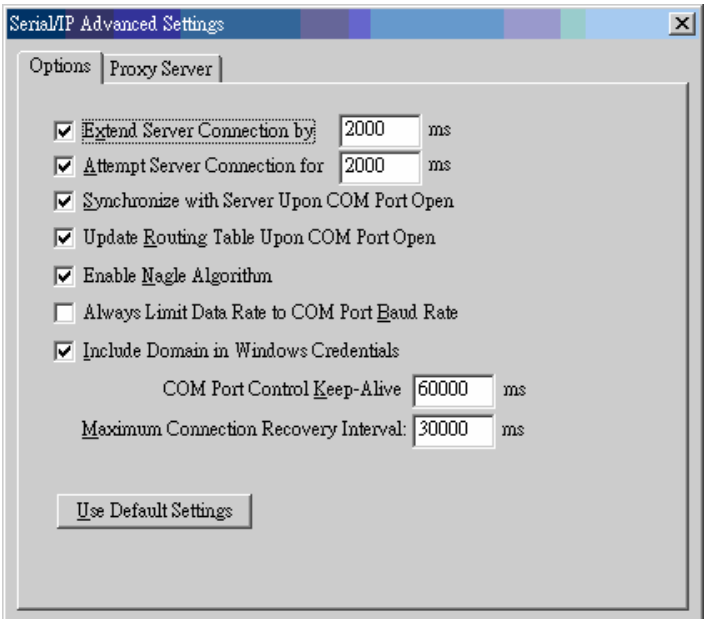
Install the Serial IP Redirector software from CD-Rom. Once it's installed, you can read the "documentation" to get assistance related to Serial IP Redirector. The documentation will be installed to your PC with the software.
The serial IP icon can be found at the right corner of system tray. Right click the icon and select **Configure**.
Click on **Select Ports** option to configure the Virtual COM ports. You can select up to 256 virtual COM ports. COM1 and COM2 are normally physical ports, so will not appear here. The selected ports will be shown on the left top corner of the Configure screen.



Selecting the "Connect to server" will allow you to enter IP address and port number. Enter the correct IP address and port number assigned to the Device Server.



After assigning the IP address and port number, you can click "Advanced" button to configure other settings.



Please refer to Serial IP document for more detail information.